Economic Freedom and Unemployment in Emerging Market Economies

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Abstract. Economic freedom has also increased in parallel with the accelerating globalization process as of mid-1980. This study investigates the relationship among unemployment, economic freedom and gross capital formation in 20 emerging market economies during 1995-2014 period using Westerlund-Durbin-Hausman (2008) cointegration test and Dumitrescu and Hurlin (2012) causality test. We found that economic freedom had no statistically significant impact on unemployment, but gross capital formation had negative impact on unemployment in the long run. Furthermore, we found a bidirectional causality between unemployment and economic freedom.

Keywords: economic freedom, gross capital formation, unemployment, emerging market economies, panel data analysis

JEL Codes: C33, E24, J68, O30

1. Introduction

Unemployment is one of the key economic problems which nearly all the countries face with various dimensions and it is also a main cause behind the inequality and poverty. Furthermore, unemployment includes many costs for individuals, societies and countries in form of decreases in life standard and talents, decreases in tax revenues, increases crimes and suicides etc. Therefore, reducing unemployment is one of the main macroeconomic objectives for all the governments.

On the other hand researchers also have investigated the causes of differences in unemployment among the countries considering its importance. In this regard, recent studies have focused the interaction between unemployment and economic freedom. Although there have been many different definitions of economic freedom in the literature (see [1], [2], [3] and [4]), economic freedom mainly reflects personal choice and voluntary exchange, protection of individuals and private property, freedom of competition and refrainment of governments from many activities [3]. So we can say that concept of economic freedom traced to Adam Smith period.

In this context, economic freedom is a reflection of political and economic institutions and legal structure in a country. Political and economic institutions and their policies and legal structure in a country form the general framework which firms and individuals operate in. Therefore, economic freedom has potential to affect labor market through economic growth and development. In this regard, many emerging market economies and developing countries have liberalized their economies gradually and in turn raised their economic freedom together with accelerating globalization process especially as of mid-1980s. In this study, we analyzed the interaction between unemployment and economic freedom in 20 emerging market economies during 1995-2014 period by employing panel data analysis. We aim to fill the gap in the literature with this study, because there have been only a few empirical studies investigating the interaction between

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unemployment and economic freedom. In this context, first we review the limited literature on economic freedom-unemployment nexus, then give information about data and method of the study. We will give major results of the empirical application in Section 4 and finally concludes the study with Conclusion.

2. Literature Review

A growing number of studies have investigated the impact of economic freedom on various economic indicators such as economic growth, unemployment, inflation, financial development. However, a large part of the studies has focused on the economic freedom-growth nexus and found that economic freedom had positive impact on economic growth (See [5], [6], [7] and [8]). But there have been a few studies which investigated the relationship between economic freedom and unemployment in the literature and these studies found that countries with higher economic growth have experienced lower unemployment rates (See [9], [10], [11] and [12]).

In one of these studies, Feldmann [9] investigated the relationship between unemployment and economic freedom in 87 countries during 1980-2003 using panel regression and found that economic freedom decreased unemployment. In another study, Garrett and Rhine [10] examined the impact of economic freedom on employment in the 50 US states for three periods (1980-1990, 1990-2000, and 2000-2005) and found that economic freedom had significant positive impact on employment.

On the other hand Erdem and Tugcu [11] investigated the relationship between economic freedom and employment in four countries (Turkey, Azerbaijan, Kazakhstan and Kyrgyzstan) during 1998-2010 period employing panel regression and found that economic freedom had positive impact on employment. Finally, Heller and Stephenson [12] also investigated the relationship among economic freedom and unemployment ratio in 50 US states during 1981-2009 period and found that economic freedom had negative impact on unemployment, while economic freedom had positive impact on labor participation.

3. Data and Econometric Methodology

3.1. Data

We employed yearly values of unemployment rate from World Bank [13] proxy for unemployment, economic freedom index of Heritage Foundation [14] proxy for economic freedom and gross capital formation from World Bank [15] proxy for domestic investments in the study. Heritage Foundation [14] calculated the index of economic freedom depending on ten factors including rule of law (property rights, freedom from corruption), limited government (fiscal freedom, government spending), regulatory efficiency (business freedom, labor freedom, monetary freedom) and open market (trade freedom, investment freedom, financial freedom). In this regard, each factor is given a grade between 0 and 100 and then overall score is calculated by taking equiponderant averages of the ten grades. We established our sample considering the countries in emerging markets index of MSCI [16], but data availability was decisive in determination of sample and study period. Our sample consisted of 20 emerging market economies (Brazil, Chile, China, Colombia, Czech Republic, Egypt, Greece, Hungary, India, Indonesia, Korea, Malaysia, Mexico, Peru, Philippines, Poland, Russia, South Africa, Thailand and Turkey) and study period was 1995-2014. The summary of data description was given in Table 1. We benefited from statistical software packages of Stata 14.0 and Gauss 10.0 for the econometric analysis.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Symbols</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unemployment, total (% of total labor force)</td>
<td>unemp</td>
<td>World Bank [13]</td>
</tr>
</tbody>
</table>
3.2. Econometric Methodology

First, we tested cross-sectional independency among the variables with LM adj. test of Pesaran et al. [17] because cross-section dimension and time dimension of the dataset equals 20 and tested homogeneity with delta tilde and adjusted delta tilde tests by Pesaran and Yamagata [18]. Later, we analyzed integration levels of the variables with panel CIPS (Cross-sectionally augmented IPS (Im-Shin-Pesaran [27]) unit root test of delta tilde and adjusted delta tilde tests by Pesaran and Yamagata [18]. Later, we analyzed integration levels of the variables with Westerlund-Durbin-Hausman [20] cointegration test, because heterogeneity and cross-sectional dependency were found in econometric analysis of the dataset. Furthermore, the individual and panel cointegrating coefficients were estimated by Augmented Mean Group (AMG) estimator (see [21], [22] and [23]). Finally causal relationships among the variables were analyzed by Dumitrescu and Hurlin [24] causality test.

Cross-sectional dependency among the variables is very important for determining further econometric tests used in the study. Therefore, we should test whether there is cross-sectional dependency in the series and the cointegrating equation. When the time dimension of the panel is higher than the cross-section dimension, the Breusch and Pagan [25] LM test was used. Otherwise, LM CD (cross-section dependence) test by Pesaran [26] was used. Later LM adj. test was developed by Pesaran et al (2008) through adding variance and mean to test statistics in order to adjust its bias, because the test yields biased results when the panel is homogeneous. In other words, group statistics are regarded when the panel is heterogeneous and panel statistics are considered when the panel is homogeneous. The null hypothesis of the test is that there is not any cointegration for all the variables.

\[ LM_{adj} = \left( \frac{2}{N(N-1)} \right)^{1/2} \sum_{i=1}^{N-1} \sum_{j=i+1}^{N} \left[ \beta_{ij}^2 \left( \frac{T - K + 1}{v_{TU}} \right) \right] \sim N(0,1) \quad (1) \]

where \( \bar{\beta}_{TU} \) represents the mean and \( v_{TU} \) represents the variance in equation 1. The test statistics from the equation 1 exhibits an asymptotically standard normal distribution. The null hypothesis of the test is that there is no cross-sectional dependence, while the alternative hypothesis is that there is cross-sectional dependence.

On the other hand panel CIPS unit root test considers the cross-sectional dependency among the series while testing the stationarity of the variables. Test statistic of the unit root test exhibits an asymptotically normal distribution and is calculated as follows:

\[ CIPS = N^{-1} \sum_{i=1}^{N} CADF_i \quad (2) \]

Finally, Westerlund-Durbin-Hausman (2008) cointegration test is employed to investigate the cointegrating relationship among the series with different integration levels as long as dependent variable is not I(0) and also regards heterogeneity and cross-sectional dependency. The test calculates two statistics called as Durbin-Hausman group statistic based on panel heterogeneity and Durbin-Hausman panel statistic based on panel homogeneity. In other words, group statistics are regarded when the panel is heterogeneous and panel statistics are considered when the panel is homogeneous. The null hypothesis of the test is that there is not any cointegration for all the variables.
4. Empirical Analysis

4.1. Cross-section Dependency and Homogeneity Tests

In the context of empirical analysis, first we employed LM adj. test of Pesaran et al. [17] in case time dimension and cross-sectional dimension both are 20 and the results were introduced in Table 2. The null hypothesis, there is cross-sectional independence, was rejected at 1% significance level, because p value was found to be 0.0000. So we found that there was a cross-section dependency among the series. Furthermore, we analyzed homogeneity with delta tilde test and adjusted delta tilde test of Pesaran and Yamagata [18] and our findings suggested that null hypothesis, there is homogeneity, was rejected and the coefficients were found to be heterogeneous.

Table 2: Results of Cross-sectional Dependence and Homogeneity Tests

<table>
<thead>
<tr>
<th>Cross-sectional dependency tests</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Test</td>
<td>Statistic</td>
<td>p-value</td>
</tr>
<tr>
<td>LM (Breusch and Pagan [25])</td>
<td>348</td>
<td>0.0000</td>
</tr>
<tr>
<td>LM adj* (Pesaran et al. [17])</td>
<td>17.13</td>
<td>0.0000</td>
</tr>
<tr>
<td>LM CD* (Pesaran [26])</td>
<td>2.304</td>
<td>0.0212</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Homogeneity tests</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Test</td>
<td>Statistic</td>
<td>p-value</td>
</tr>
<tr>
<td>Delta_tilde</td>
<td>13.641</td>
<td>0.000</td>
</tr>
<tr>
<td>Delta_tilde_adj</td>
<td>15.161</td>
<td>0.000</td>
</tr>
</tbody>
</table>

* two-sided test

4.2. CIPS Panel Unit Root Test

We analyzed integration levels of the variables by CIPS (Cross-sectionally augmented IPS (Im-Shin-Pesaran [27]) unit root test of Pesaran [19], because we revealed a cross-sectional dependency among the series. The results of the test were given in Table 3. The findings indicated that unemp and gcf were I(1), while efr was I(0).

Table 3: Results of CIPS Panel Unit Root Test

<table>
<thead>
<tr>
<th>Variables</th>
<th>Constant</th>
<th>Constant + Trend</th>
</tr>
</thead>
<tbody>
<tr>
<td>unemp</td>
<td>0.344 (0.635)</td>
<td>-1.208 (0.114)</td>
</tr>
<tr>
<td>d(unemp)</td>
<td>-6.629 (0.000)***</td>
<td>-4.931 (0.000)***</td>
</tr>
<tr>
<td>efr</td>
<td>-2.061 (0.020)**</td>
<td>-2.503 (0.006)***</td>
</tr>
<tr>
<td>d(efr)</td>
<td>-7.165 (0.000)***</td>
<td>-5.661 (0.000)***</td>
</tr>
<tr>
<td>gcf</td>
<td>-0.686 (0.246)</td>
<td>-0.204 (0.419)</td>
</tr>
<tr>
<td>d(gcf)</td>
<td>-7.026 (0.000)***</td>
<td>-4.237 (0.000)***</td>
</tr>
</tbody>
</table>

***,** denotes that it is respectively significant at 1% and 5% level


We used Westerlund-Durbin-Hausman [20] cointegration test to analyze the long run relationship among unemployment, economic freedom and gross capital formation, because dependent variable unemp was I(1) and the variables had different integration levels and the findings were given in Table 4. We regarded group statistic, because our panel was heterogeneous and it indicated that the null hypothesis (there is not any cointegration for all variables) was rejected and there was cointegration for some units.
### Table 4: Results of Westerlund-Durbin-Hausman (2008) Cointegration Test

<table>
<thead>
<tr>
<th></th>
<th>Statistic</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Durbin-Hausman Group Statistic</td>
<td>13.287</td>
<td>0.000</td>
</tr>
<tr>
<td>Durbin-Hausman Panel Statistic</td>
<td>0.319</td>
<td>0.375</td>
</tr>
</tbody>
</table>

### 4.4. Estimation of Long run Cointegrating Coefficients

We estimated the cointegrating coefficients by AMG estimator which regards both heterogeneity and cross-sectional dependency and the findings were presented in Table 5. The results indicated that economic freedom had negative but statistically insignificant impact on unemployment in overall panel, while gross capital formation had negative impact on unemployment in overall panel. However, individual cointegrating coefficients indicated that economic freedom had negative impact on unemployment in Chile, Greece, Hungary, Indonesia and Peru, while economic freedom had positive impact on unemployment in Brazil, Mexico, Philippines, South Africa and Thailand. Furthermore economic freedom had no significant impact on unemployment in China, Colombia, Czech Republic, Egypt, India, Korea, Malaysia, Poland, Russia and Turkey. Our finding is partially consistent with the empirical literature.

On the other hand gross capital formation had negative impact on unemployment in Brazil, Chile, Colombia, Czech Republic, Egypt, Greece, Hungary, Indonesia, Korea, Mexico, Peru, Poland, Russia, Thailand and Turkey, while gross capital formation had no significant impact on unemployment in China, India, Malaysia, Philippines, South Africa and Thailand.

### Table 5: Long run Cointegrating Coefficients

<table>
<thead>
<tr>
<th>Country</th>
<th>EFR</th>
<th>GCF</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coefficient</td>
<td>P value</td>
</tr>
<tr>
<td>Brazil</td>
<td>0.0860971</td>
<td>0.086*</td>
</tr>
<tr>
<td>Chile</td>
<td>-0.1953535</td>
<td>0.047**</td>
</tr>
<tr>
<td>China</td>
<td>-0.1275174</td>
<td>0.208</td>
</tr>
<tr>
<td>Colombia</td>
<td>-0.1106843</td>
<td>0.162</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>-0.189352</td>
<td>0.220</td>
</tr>
<tr>
<td>Egypt</td>
<td>-0.040366</td>
<td>0.618</td>
</tr>
<tr>
<td>Greece</td>
<td>-1.012945</td>
<td>0.000***</td>
</tr>
<tr>
<td>Hungary</td>
<td>-0.2699205</td>
<td>0.000***</td>
</tr>
<tr>
<td>India</td>
<td>-0.0988606</td>
<td>0.142</td>
</tr>
<tr>
<td>Indonesia</td>
<td>-0.4222549</td>
<td>0.000***</td>
</tr>
<tr>
<td>Korea</td>
<td>0.0180211</td>
<td>0.852</td>
</tr>
<tr>
<td>Malaysia</td>
<td>-0.0160583</td>
<td>0.693</td>
</tr>
<tr>
<td>México</td>
<td>0.2286683</td>
<td>0.007***</td>
</tr>
<tr>
<td>Peru</td>
<td>-0.096678</td>
<td>0.076*</td>
</tr>
<tr>
<td>Philippines</td>
<td>0.2917681</td>
<td>0.015**</td>
</tr>
<tr>
<td>Poland</td>
<td>-0.2242227</td>
<td>0.317</td>
</tr>
<tr>
<td>Russia</td>
<td>-0.1014801</td>
<td>0.802</td>
</tr>
<tr>
<td>South Africa</td>
<td>0.7299216</td>
<td>0.015**</td>
</tr>
<tr>
<td>Thailand</td>
<td>0.1480662</td>
<td>0.023**</td>
</tr>
</tbody>
</table>
4.5. Dumitrescu and Hurlin [24] Panel Causality Test

We examined the casual relationships among unemployment, economic freedom and gross capital formation by Dumitrescu and Hurlin [24] panel causality test and the results were given in Table 6. The results indicated that there was two-way causality between unemployment and economic freedom. In other words economic freedom and unemployment feedback each other in the short run.

Table 6: Results of Panel Causality Test

<table>
<thead>
<tr>
<th>Null hypothesis</th>
<th>EFR</th>
<th>GCF</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coefficient</td>
<td>P value</td>
</tr>
<tr>
<td>Turkey</td>
<td>-0.0362751</td>
<td>0.726</td>
</tr>
<tr>
<td>Panel</td>
<td>-0.0719713</td>
<td>0.328</td>
</tr>
</tbody>
</table>

***, ** denotes that it is respectively significant at 1%, 5% and 10% level

5. Conclusion

Globalization process caused the countries to liberalize their institutions and policies gradually as of 1980s. In this regard, many countries made structural reforms and changed their economic policies. Hence the researchers began to investigate the impact of changes in institutions and policies on various economic variables such as economic growth, unemployment, inflation and competitiveness etc. In this study, we analyzed the interaction among unemployment, economic freedom and gross capital formation in emerging market economies during 1995-2014 period employing Westerlund-Durbin-Hausman [20] cointegration test and Dumitrescu and Hurlin [24] panel causality test. The results of the econometric tests suggested that gross capital formation had negative impact on unemployment in most countries of the sample. However, economic freedom had negative impact on unemployment in only Chile, Greece, Hungary, Indonesia and Peru, while economic freedom had positive impact on unemployment in Brazil, Mexico, Philippines, South Africa and Thailand.

We reached mixed findings about the relationship between economic freedom and unemployment in contrast to the empirical literature on economic freedom-unemployment nexus. However, theoretically it is expected that improvements in economic freedom decrease the unemployment through fostering economic growth and encouraging new ventures. So we evaluated that this difference could be arisen from country-specific properties. Policymakers should consider the impact of economic freedom on unemployment through economic growth while designing institutions and economic policies. Finally, further studies can be conducted to examine the relationship between unemployment and main components of overall index such as property rights, fiscal freedom, labor freedom etc.
6. References


