FINANCIAL DEVELOPMENT AND UNEMPLOYMENT
IN EMERGING MARKET ECONOMIES

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Abstract

Financial sector has experienced significant expansion together with accelerating financial globalization in recent years and had important positive and negative economic implications for all the economies. This study investigates the interaction among unemployment, financial development and domestic investment in 16 emerging market economies during 2001-2014 period using panel data analysis. We found that there was long relationship among the variables and domestic investment had negative impact on the unemployment, while financial development had no significant impact on the unemployment. Furthermore, there was unidirectional causality from development of financial sector to unemployment.

Keywords: financial development, gross capital formation, unemployment, panel data analysis

JEL classification: C33, E24, E44

1. INTRODUCTION

Financial sector has expanded substantially in recent years together with the globalization process and become the main actor in fund transfers between savers and economic units with funding gap. Also, international portfolio flows have exceeded the flows of goods and services among the countries in the globalized world. The significant increases in size of financial sector and flows of financial assets among the countries with impact of financial globalization led many macroeconomic effects for the national economies. On the other hand icreasing frequency and severity of financial crises compared to the past, which also reflect the problems in the financial system, has begun to damage the real sector more severely.

The extensive theoretical and empirical studies verified that development of financial sector has potential to affect employment through easing the access to capital markets and provision of cheap funds for investments by firms and entrepreneurs and in turn contribute to the employment through economic growth (see Hassan *et al.*, 2011; Caporale *et al.*, 2015; Cojocaru *et al.*, 2016). However, theoretical and empirical studies also showed that financial crises or disruptions in the financial system do serious harm to economic activity and in turn

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employment (see Barro, 2001; Gros and Alcidi, 2010; Claessens *et al.*, 2012). For example global unemployment increased 7.4% in 2008 due to recent financial crises (World Bank, 2009). Consequently development and expansion of financial sector is important for real economy, but possible adverse problems in the financial sector also may lead serious problems in overall economy.

In this regard, we investigated the interaction between unemployment and development of financial sector which there has been a limited number of studies in the literature and this study contributes to the current literature by investigating the nexus between finance and unemployment for the emerging market economies. Therefore, this study examined the possible interaction between financial markets and labor markets in 16 emerging market economies during 2001-2014 period using Westerlund-Durbin-Hausman (2008) cointegration test and Dumitrescu and Hurlin (2012) causality test. We will overview the studies on the nexus between unemployment and financialdevelopment in Section 2. Section 3 introduces data and method, Section 4 gives major findings. Finally the study is concluded with Conclusion.

2. LITERATURE REVIEW

Financial globalization has induced the financial sector to dominate the economies especially as of 1990s in the world. The increasing impact of financial sector on overall economy has led the researchers to conduct the studies related to the impact of changes in financial sector on various variables such as economic growth, unemployment, income inequality, innovation and volatility. But a large part of the studies concentrated on the interaction between economic growth and development of financial sector due to emergence of endogenous growth theories and revealed that financial sector development has become an important component of long run growth and boosted the economic growth (see Hassan *et al.*, 2011; Caporale *et al.*, 2015; Cojocaru *et al.*, 2016). However, the limited number of studies have concentrated on relationship between unemployment and financial development and have reached different findings depending on the countries, study period and method. However, the studies which have investigated macroeconomic impact of domestic investment generally have focused on the interaction between economic growth and gross domestic investment and revealed that gross capital formation affected economic growth positively (see Uneze, 2013; Ongo and Vukenkeng, 2014).

In one of these studies, Gatti and Vaubourg (2009) investigated the interaction between unemployment and financial development in selected OECD member countries during 1980-2004 period using panel regression and found that stock market capitalization had negative impact on unemployment. Furthermore, they found that impact of credits provided by financial sector on unemployment was negative in case of strongly regulated labor market, but it had positive impact on unemployment in other cases. On the other hand Shabbir *et al.* (2012) examined the nexus among unemployment and diverse indicators of financial development in Pakistan during 1973-2007 period using autoregressive distributed lag (ARDL) cointegration and Granger causality test and found that most of the indicators including stock market capitalization, financial assets stock and provision of domestic credit for private sector affected unemployment negatively in the long run.

Moreover, Kanberoğlu (2014) investigated the relationship among unemployment and major indicators of financial development in Turkey during 1985-2010 period with regression analysis and revealed that broad money supply affected unemployment positively, while development of financial sector had negative impact on unemployment. Also Ilo (2015)

investigated the relationship between unemployment and capital market development in Nigeria during 1986-2012 period using Johansson cointegration test and found that there was no significant relationship among unemployment, banking sector and stock market development. Finally, Ogbeide *et al.* (2015) also researched the interaction between unemployment and development level of banking sector in Nigeria during 1981-2013 period and revealed a positive relationship between unemployment and banking sector development.

3. DATA AND METHOD

We researched the relationship among unemployment, financial development and gross capital formation in 16 emerging market economies during 2001-2014 period using Westerlund-Durbin-Hausman (2008) cointegration test and Dumitrescu and Hurlin (2012) causality test.

3.1. Data

We employed yearly values of unemployment rate proxy for unemployment, domestic credit provided for private sector proxy for development level of financial sector and gross capital formation proxy for domestic investments in the study. We established our sample considering the countries in emerging markets index of MSCI (2016), but data availability was decisive in determination of sample and study period. Our sample consisted of 16 emerging market economies (Brazil, Colombia, Chile, Czech Republic, Egypt, Hungary, Indonesia, Malaysia, Mexico, Philippines, Qatar, Russia, South Africa, South Korea, Thailand and Turkey) and study period was 2001-2014. The summary of data description was given in Table no. 1.

Table no. 1 – Data description

Variables	Symbols	Source
Unemployment, total (% of total labor force)	unemp	World Bank (2016c)
Domestic credit to private sector (percent of GDP)	dcrd	World Bank (2016a)
Gross capital formation (percent of GDP)	gcf	World Bank (2016b)

Table no. 2 – Descriptive statistics and the correlation matrix of the variables in the study

Statistics	unemp	dcrd	gcf
Mean	7.820982	61.63905	23.77291
Median	7.300000	45.01638	22.63515
Maximum	27.20000	160.1249	46.01657
Minimum	0.300000	13.44640	14.04686
Std. Dev.	5.544913	40.57958	5.335503
Skewness	1.513796	0.880829	1.104586
Kurtosis	5.913488	2.397265	4.731008
Correlation matrix	**unemp**	**dcrd**	**gcf**
unemp	1	0.136955	-0.540552
dcrd	0.136955	1	0.100079
gcf	-0.540552	0.100079	1

We benefited from Stata 14.0, EViews 9.0 and Gauss 11.0 software packages for the econometric analysis of the study. The descriptive statistics and correlation matrix of the variables in the study are presented in Table no. 2. The correlation matrix showed that there was a positive correlation between both financial development and unemployment and financial development and gross capital formation.

3.2. Econometric methodology

Cross-sectional dependency and homogeneity among the variables exhibit importance for selection of further econometric tests used in the empirical analysis such as unit root test and cointegration test. Therefore, first we tested cross-sectional independency among the series with LM CD test of Pesaran (2004) because N (cross-section dimension)=16 is higher than T (time dimension)=14 and tested homogeneity with delta tilde and adjusted delta tilde tests by Pesaran and Yamagata (2008). Later, we analyzed integration levels of the variables with CIPS unit root test of Pesaran (2007) that regards cross-sectional dependency. Then we investigated long run relationship among unemployment, financial sector development and gross capital formation with Westerlund-Durbin-Hausman (2008) cointegration test, because heterogeneity and cross-sectional dependence were found in econometric analysis of dataset and cointegrating coefficients was estimated by Augmented Mean Group (AMG) estimator (see Eberhardt and Bond, 2009), Eberhardt and Teal, 2010 and 2011). Finally, we analyzed the casual relation among unemployment, financial sector development and gross domestic investment with Dumitrescu and Hurlin (2012) causality test.

4. EMPIRICAL ANALYSIS

4.1. Analysis of cross-sectional dependence and homogeneity

We used LM CD test of Pesaran (2004), because T (time dimension) is lower than N (cross-sectional dimension) in the dataset. The test statistic exhibits an asymptotically normal distribution and is calculated as follows:

$$LM\ CD = \sqrt{\frac{1}{N(N-1)}} \left(\sum_{i=1}^{N-1} \sum_{j=i+1}^{N} \left(2\rho_{ij}^2 - 1 \right) \right) \tag{1}$$

We tested cross-sectional independency among the series with LM CD test of Pesaran (2004) and the results were introduced in Table no. 3. The null hypothesis, there is cross-sectional independency, was rejected at 1% significance level, because p value was found to be 0.0000. So we revealed a cross-section dependence among the series. Furthermore, we analyzed homogeneity with delta tilte test and adjusted delta tilde test of Pesaran and Yamagata (2008) and our findings revealed that null hypothesis, there is homogeneity, was rejected and the cointegrating coefficients were found to be heterogenous.

Table no. 3 – Results of cross-sectional dependence and homogeneity tests

Cross-sectional dependency tests		
Test	**Statistic**	**p-value**
LM (Breusch and Pagan, 1980)	205.9	0.0000
LM adj* (Pesaran *et al.*, 2008)	7.964	0.0000
LM CD* (Pesaran, 2004)	4.569	0.0000
Homogeneity tests		
Test	**Statistic**	**p-value**
Delta_tilde	7.900	0.000
Delta_tilde_adj	9.226	0.000

*two-sided test

4.2. Panel CIPS unit root test

We analyzed integration levels of the variables by CIPS (Cross-sectionally augmented IPS (Im *et al.*, 2003) unit root test of Pesaran (2007), because we revealed a cross-sectional dependency among the series. The test exhibits an asymptotically normal distribution and is calculated as follows:

$$CIPS = N^{-1} \sum_{i=1}^{N} CADF_i \qquad (2)$$

We conducted CIPS test and the results were given in Table no. 4. The findings indicated that unemp, dcrd and gcf were I(1).

Table no. 4 – CIPS unit root test results

Variables	Constant	Constant + Trend
unemp	-0.411 (0.340)	-0.403 (0.344)
d(unemp)	-10.508 (0.000)*	-7.809 (0.000)*
dcrd	-0.403 (0.374)	1.409 (0.921)
d(dcrd)	-7.274 (0.000)*	-6.340 (0.000)*
gcf	0.239 (0.595)	-1.240 (0.107)
d(gcf)	-10.201 (0.000)*	-7.020 (0.000)*

* significance at 1% level

4.3. Cointegration test

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. We analyzed the cointegrating relationship among the variables by Westerlund-Durbin-Hausman (2008) cointegration test regarding heterogeneity and cross-sectional dependence and our findings were given in Table no. 5. We regarded group statistic, because our panel was heterogeneous

and it indicated that the null hypothesis (H_0: there is not any cointegration for all variables) was rejected and there was cointegration for some units.

Table no. 5 – Results of Westerlund-Durbin-Hausman (2008) cointegration test

	Statistic	p-value
Durbin-Hausman Group Statistic	19.928	0.000
Durbin-Hausman Panel Statistic	5.956	0.000

4.4. Long run cointegrating coefficients

We estimated the cointegrating coefficients by AMG estimator which regards heterogeneity and cross-sectional dependency and the findings were presented in Table no. 6. The results indicated that financial development had no significant impact on unemployment in overall panel, while domestic investment had negative impact on unemployment in overall panel. However, individual cointegrating coefficients indicated that financial development had negative impact on unemployment in Brazil, Czech Republic, Egypt, Malaysia, Qatar, Russia while financial development had positive impact on unemployment in Hungary and Mexico.

Table no. 6 – Long run cointegrating coefficients

Country	DCRD		GCF	
Country	Coefficient	p-value	Coefficient	p-value
Brazil	-0.0480869	0.000***	-0.1084041	0.257
Chile	-0.0209061	0.176	-0.1615481	0.202
Colombia	-0.0209311	0.602	-0.4611292	0.001***
Czech Republic	-0.0580179	0.021**	-0.2212219	0.039**
Egypt	-0.0562961	0.017**	-0.5202632	0.000***
Hungary	0.077121	0.002***	-.5782118	0.000***
Indonesia	0.1231502	0.296	-.3593419	0.003***
Korea	0.0074261	0.229	.0215796	0.702
Malaysia	-0.019518	0.061*	.0023401	0.959
Mexico	0.1814295	0.000***	.1310603	0.170
Philippines	-0.0031375	0.979	.5195768	0.006***
Qatar	-0.0242997	0.082*	.0142166	0.359
Russia	-0.0464187	0.000***	-.0826939	0.305
South Africa	-0.0387429	0.126	-.2439259	0.188
Thailand	-0.006689	0.277	-.0311883	0.509
Turkey	0.0003097	0.988	-.065432	0.701
Panel	**0.0028995**	**0.864**	**-0.1340367**	**0.048**

***, ** and * respectively denotes that they are significant at 1%, 5% and 10%

4.5. Dumitrescu and Hurlin (2012) causality test

Short-term causal relationship between the series was tested with Dumitrescu and Hurlin (2012) causality test and the findings were presented in Table no. 7. The findings indicated that there was unidirectional causal relationship from financial development to unemployment, because null hypothesis was rejected.

Table no. 7 – Causality test results

Null hypothesis	W-Stat.	Zbar-Stat.	Prob.
Δdcrd↛Δunemp	**3.05366**	**3.07475**	**0.0021**
Δunemp ↛ Δdcrd	1.49339	0.36118	0.7180
Δgcf ↛ Δdunemp	1.61811	0.57810	0.5632
Δunemp ↛ Δgcf	1.01916	-0.46358	0.6430
Δgcf ↛ Δdcrd	1.28278	-0.00511	0.9959
Δdcrd ↛ Δgcf	1.32474	0.06786	0.9459

* Lag length was taken as 1.

5. CONCLUSIONS

Development of financial sector has important macroeconomic implications and a consensus on the positive interaction between finance and growth is also about to be formed. But however, financial crises are the reflection of problems in the financial sector and affect the economies negatively. So the net impact of financial development on the major macroeconomies variables depends on whether the positive impact of financial development outweighs its negative impact. In this context, we researched the interaction among unemployment, financial sector development and gross capital formation in emerging market economies during 2001-2014 period using Westerlund-Durbin-Hausman (2008) cointegration test and Dumitrescu and Hurlin (2012) causality test. The panel long run cointegrating coefficients indicated that financial development had no significant impact on unemployment, while gross capital formation had negative impact on unemployment. However, individual cointegrating coefficients denoted that financial development had negative impact on unemployment in Brazil, Czech Republic, Egypt, Malaysia, Qatar, Russia while financial development had positive impact on unemployment in Hungary and Mexico. Furthermore Dumitrescu and Hurlin (2012) causality test denoted a one-way causal relationship from financial development to unemployment.

Theoretically financial development is expected to decrease unemployment through economic growth and job creation in expanding financial sector. But limited number of studies and our study have reached mixed findings about the relationship between financial development and unemployment. We found that financial development decreased the unemployment only in Brazil, Czech Republic, Egypt and Malaysia. However, our findings indicated that financial sector has not contributed to employment in most of the countries in the sample yet. So the findings of our study and some studies such as Gatti and Vaubourg (2009), Kanberoğlu (2014) and Ogbeide *et al.* (2015) led a contraction with the theoretical expectations. We evaluated that this contradiction can be resulted from a few potential causes. First, financial development can have influence on unemployment especially through economic growth provided that if a country achieves improvements in the other determinants of economic growth such as human capital, infrastructure, institutional quality, entrepreneurship and technological progress. So this contradiction may be arisen from the mismatch among financial development and the determinants of economic growth. Secondly financial sector can be useful for real economy after reaching a threshold level, because financial sector generally cannot attract sufficient funds and in turn do not provide and mobilize funds sufficiently to foster economic growth in its early stages of development. So underdevelopment of financial sector may be a reason of the contradiction in question.

We suggest that the policymakers should contribute to the development of financial sector and real sector balancedly and encourage the savers to utilize their funds in the financial sector by strengthening institutional structure of the sector and the diverse incentives in the light of our findings. Finally, we suggest that future studies should investigate the interaction between unemployment and financial sector development by classifying the countries in terms of development level of financial sector.

References

Barro, R. J., 2001. Economic Growth in East Asia Before and After the Financial Crisis. DOI:http://dx.doi.org/10.3386/w8330

Breusch, T. S., and Pagan, A. R., 1980. The Lagrange multiplier test and its applications to model specification in econometrics. *The Review of Economic Studies, 47*(1), 239-253. DOI: http://dx.doi.org/10.2307/2297111

Caporale, G. M., Rault, C., Sova, A. D., and Sova, R., 2015. Financial development and economic growth: Evidence from 10 new European Union members. *International Journal of Finance & Economics, 20*(1), 48-60. DOI: http://dx.doi.org/10.1002/ijfe.1498

Claessens, S., Tong, H., and Wei, S. J., 2012. From the financial crisis to the real economy: Using firm-level data to identify transmission channels. *Journal of International Economics, 88*(2), 375-387. DOI: http://dx.doi.org/10.1016/j.jinteco.2012.02.015

Cojocaru, L., Falaris, E. M., Hoffman, S. D., and Miller, J. B., 2016. Financial system development and economic growth in transition economies: New empirical evidence from the CEE and CIS countries. *Emerging Markets Finance & Trade, 52*(1), 223-236. DOI: http://dx.doi.org/10.1080/1540496X.2015.1013828

Dumitrescu, E. I., and Hurlin, C., 2012. Testing for Granger non-causality in heterogeneous panels. *Economic Modelling, 29*(4), 1450-1460. DOI: http://dx.doi.org/10.1016/j.econmod.2012.02.014

Eberhardt, M., and Bond, S., 2009. Cross-section dependence in nonstationary panel models: A novel estimator. https://mpra.ub.uni-muenchen.de/17870/

Eberhardt, M., and Teal, F., 2010. Productivity analysis in global manufacturing production. *Discussion Paper Series*. http://www.economics.ox.ac.uk/materials/papers/4729/paper515.pdf

Eberhardt, M., and Teal, F., 2011. Econometrics for grumblers: A new look at the literature on cross-country growth empirics. *Journal of Economic Surveys, 25*(1), 109-155. DOI: http://dx.doi.org/10.1111/j.1467-6419.2010.00624.x

Gatti, D., and Vaubourg, A. G., 2009. Unemployment and finance: How do financial and labour market factors interact? *IZA Discussion Paper*. http://ftp.iza.org/dp4075.pdf

Gros, D., and Alcidi, C., 2010. The impact of the financial crisis on the real economy. *Intereconomics, 45*(1), 4-20. DOI: http://dx.doi.org/10.1007/s10272-010-0320-0

Hassan, M. K., Sanchez, B., and Yu, J. S., 2011. Financial development and economic growth: New evidence from panel data. *The Quarterly Review of Economics and Finance, 51*(1), 88-104. DOI: http://dx.doi.org/10.1016/j.qref.2010.09.001

Ilo, B. M., 2015. Capital market and unemployment in Nigeria. *Oeconomica, 11*(5), 129-140.

Im, K. S., Pesaran, M. H., and Shin, Y., 2003. Testing for unit roots in heterogeneous panels. *Journal of Econometrics, 115*(1), 53-74. DOI: http://dx.doi.org/10.1016/S0304-4076(03)00092-7

Kanberoğlu, Z., 2014. Finansal sektör gelişimi ve işsizlik: Turkiye örneği. *Ekonomik ve Sosyal Araştırmalar Dergisi, 10*(1), 83-93.

MSCI, 2016. MSCI emerging markets index-emerging markets. Retrieved 26 February 2016, from https://www.msci.com/emerging-markets

Ogbeide, F. I., Kanwanye, H., and Kadiri, S., 2015. The determinants of unemployment and the question of inclusive growth in Nigeria: Do resource dependence, government expenditure and

financial development matter? *Montenegrin Journal of Economics, 11*(2), 49-64. DOI: http://dx.doi.org/10.14254/1800-5845.2015/11-2/3

Ongo, E. N., and Vukenkeng, A. W., 2014. Does gross capital formation matter for economic growth in the CEMAC sub-region? *EuroEconomica, 33*(2), 69-77.

Pesaran, M. H., 2004. General diagnostic tests for cross section dependence in panels. *CESifo Working Papers No. 1233*, 255-260.

Pesaran, M. H., 2007. A simple panel unit root test in the presence of cross-section dependence. *Journal of Applied Econometrics, 22*(2), 265-312. DOI: http://dx.doi.org/10.1002/jae.951

Pesaran, M. H., Ullah, A., and Yamagata, T., 2008. A bias-adjusted LM test of error cross-section independence. *The Econometrics Journal, 11*(1), 105-127. DOI: http://dx.doi.org/10.1111/j.1368-423X.2007.00227.x

Pesaran, M. H., and Yamagata, T., 2008. Testing slope homogeneity in large panels. *Journal of Econometrics, 142*(1), 50-93. DOI: http://dx.doi.org/10.1016/j.jeconom.2007.05.010

Shabbir, G., Anwar, S., Hussain, Z., and Imran, M., 2012. Contribution of financial sector development in reducing unemployment in Pakistan. *International Journal of Economics and Finance, 4*(1), 260-268. DOI: http://dx.doi.org/10.5539/ijef.v4n1p260

Uneze, E., 2013. The relation between capital formation and economic growth: Evidence from sub-Saharan African countries. *Journal of Economic Policy Reform, 16*(3), 272-286. DOI: http://dx.doi.org/10.1080/17487870.2013.799916

Westerlund, J., 2008. Panel cointegration tests of the Fisher effect. *Journal of Applied Econometrics, 23*(2), 193-233. DOI: http://dx.doi.org/10.1002/jae.967

World Bank, 2009. Impact of the financial crisis on employment. Retrieved 20 February 2016, from http://web.worldbank.org/WBSITE/EXTERNAL/NEWS/0,,contentMDK:21039894~menuPK:34480~pagePK:116743~piPK:36693~theSitePK:4607,00.html

World Bank, 2016a. Domestic credit to private sector (% of GDP) Retrieved 26 February 2016 http://data.worldbank.org/indicator/FS.AST.PRVT.GD.ZS

World Bank, 2016b. Gross capital formation (% of GDP) Retrieved 26 February 2016 http://data.worldbank.org/indicator/NE.GDI.TOTL.ZS

World Bank, 2016c. Unemployment, total (% of total labor force). Retrieved 26 February 2016 http://data.worldbank.org/indicator/SL.UEM.TOTL.ZS