



How does Financial Inclusion Affect Unemployment? Evidence from Selected Upper Middle and Lower Middle-Income Countries

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Abstract

The main objective of this study is to empirically examine the impact of financial inclusion on the rate of unemployment. To execute the research idea, the study has considered 31 countries (16 Upper-Middle Income and 15 Lower-Middle Income), over the period of 2004-2019. For the empirical analysis, the study has used Fixed Effect, Random Effect, Panel Corrected Standard Errors, Feasible General Least Square and System Dynamic Panel models. The empirical findings suggest that in the overall sample (that includes both UMI and LMI) and UMI countries, financial inclusion plays a significant role in reducing unemployment. The results from both the overall sample countries and UMI countries demonstrate that the basic level of financial inclusion has no impact on the rate of unemployment, whereas the more intense financial inclusion beyond the basic level helps to reduce the rate of unemployment. Similarly, the findings from LMI countries indicate that financial inclusion has no impact on unemployment, neither at the basic level nor at the advanced level. With context to financial inclusion and unemployment, this study is a first attempt to empirically examine the inter-relationship between financial inclusion and unemployment among the UMI and LMI countries.

Keywords: Financial Inclusion, Unemployment, Upper Middle Income, Lower-Middle Income, Cross-Country.

JEL Classifications: Q32, Q044

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1. Introduction

The global unemployment rate has been a matter of concern for academia and political leadership across the globe for the last several decades. The World Bank dataset² reveals that the global unemployment rate in the recent past became as high as 6.01 percent in 2003, 6.02 percent in 2010, and 6.47 percent in 2020, respectively. During the last two decades, it never reached below the 5 percent mark. The World Bank data also reveals vast variations in the unemployment rates. Countries like Cambodia, Niger, Burundi, Thailand, Rwanda, and Myanmar had an unemployment rate below two percent in 2020. Similarly, there are countries like Armenia, Namibia, and South Africa with unemployment rates above 20 percent. This unevenness of the unemployment rate poses a severe challenge to understanding the factors that influence the unemployment rate and its trajectories.

The second issue that this paper deals with is financial inclusion, which traces its origins to the late 1990s. It is a process that facilitates easing access, availability, and usage of financial services in a country for all its citizens (Sarma & Pais, 2011). Financial inclusion, in a very simplistic manner, can be defined as bringing the unbanked population into the banking system of any country (Pearce, 2011). It is a process of incorporating the poorest of the poor into the country's financial system, so that they get access to all kinds of financial services (Allen et al., 2016). In recent times, financial inclusion has been at the centre stage of discussion among scholars and the political class for four reasons (Ozili, 2021). Firstly, some scholars like Demirguc-Kunt et al., (2017) argued that financial inclusion will facilitate a country's achievement of the United Nation's (UN) Sustainable Development Goals (SDGs). Secondly, it is also argued that financial inclusion will promote social inclusion, especially in many developing countries (Bold et al., 2012). Thirdly, financial inclusion can be very instrumental in reducing poverty, as put forth by Neaime and Gaysset (2018). Fourthly, financial inclusion promotes economic growth (Kpodar & Andrianaivo, 2011).

The main purpose of financial inclusion is not only to provide basic banking services to the poorest of the poor, but also to extend bank credits to small and medium-scale enterprises. The provision of microloans to the small and medium business enterprises of any country can be a very practical mode of job creation (Garrido et al., 2012). An extension of microloan to an individual can assist the person to extend his or her business outreach, create job opportunities for other people, create scope for self-employment, and integrate the workforce with mainstream economic activities. The objective behind providing financial assistance to small entrepreneurs with meagre resources is to facilitate their ability to get maximum returns on their economic activities, which will also ultimately stimulate job creation (Arias, 2015). Similarly, some scholars also argue that the most potent strength of financial inclusion is the promotion of innovation, which might be helpful for job creation (Gabor & Brook, 2017; Ozili, 2018).

While going through our literature survey, we found that there are a handful studies conducted to depict the impact of financial development on unemployment (Aliero et al., 2013; Bayar, 2016; Epstein & Shapiro, 2019; Ajide, 2020; Ibrahiem & Sameh, 2020; Chen et al., 2021). However, there is a dearth of studies depicting the effect of financial inclusion on unemployment. As financial inclusion has received much attention in recent times, measuring the impact of financial inclusion on unemployment is essential. From our

² World Bank data reveals wide variation in employment rates among different countries (Source: <https://data.worldbank.org/indicator/SL.UEM.TOTL.ZS>).

literature review, we found the existence of a strong interrelationship between financial inclusion and unemployment, but the empirical linkages among these two variables lacking in the academic literature. Therefore, in order to fill the gap, the study here endeavours to empirically examine the impact of financial inclusion on employment in upper and lower middle-income countries.

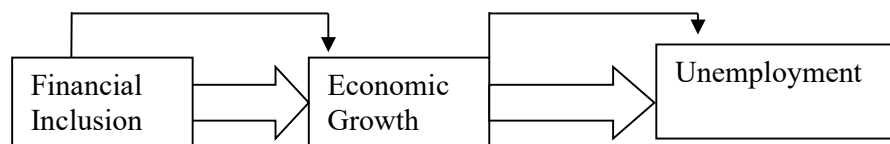
The rest of the paper is structured in the following manner: Section 2 discusses the theoretical relationship between financial inclusion and the unemployment rate. Section 3 will highlight some literature reviews on this topic. Section 4 will explain the data and econometrics techniques used in this study. Section 5 will discuss the results, followed by section 6 as the concluding remark and section 7 policy implications of the study.

2. Theoretical Relationship

Before going for empirical analysis, a theoretical understanding of financial inclusion and unemployment is crucial for this paper. Therefore, to understand the exact relationship between financial inclusion and unemployment, we need to capture the path between economic growth and unemployment. To understand this path, we will introduce the concept of the ‘pool of saving effect’ (Bean & Pissarides, 1993). As Bean and Pissarides (1993) presented, the pool of saving effect is that unemployment leads to a reduction in saving, which further affects the rate of capital accumulation and slows down economic growth in a country. But financial inclusion always facilitates more saving, which helps to accumulate more capital and support economic growth and employment. The ‘pool of saving effect’ shows only one aspect of financial inclusion. There are other aspects of it that highlight the process of employment generation through financial inclusion.

Similarly, financial inclusion can also have some impact on unemployment through another growth theory called “Okun's law”. The law explains the relationship between economic growth and unemployment. It says that if output increases in a country, the rate of unemployment will fall (Ball et al., 2017). On the other hand, academic literature has confirmed the positive impact of financial inclusion on economic growth (Mohan, 2006; Kim et al., 2018; Babajide et al., 2015; Lenka & Sharma, 2017; Williams et al., 2017). That means the process of financial inclusion would boost economic growth and the growth of the economy, on the other hand, would reduce the level of unemployment in the economy.

Figure 1: Relationship between Financial Inclusion and Unemployment via Economic Growth



Source: Prepared by Authors

3. Literature Survey

Scholars have argued for financial inclusion at different points of time as it has multidimensional benefits to the individual and society at large. Researchers like Inoue (2011, 2018); Park and Mercado (2017); Zhang and Posso (2019) argued the negative effect of financial inclusion on poverty reduction. Likewise, some other scholars, like Ghosh (2013) and Sarma & Pais (2011), argued that financial inclusion pushes socio-economic development. Correspondingly, with context to the effect of financial inclusion on some macroeconomic indicators, studies have found that financial inclusion brings financial stability (Barik & Pradhan, 2021; Hanning & Jansen, 2010; Cull et al., 2012; Sahay et al., 2015), boosts the economic growth (Dixit & Ghosh, 2013; Mohan, 2006; Kim, 2016; Kim et al., 2018; Babajide et al., 2015; Lenka & Sharma, 2017; Sethi & Acharya, 2018; Van et al., 2021) and reduces the inflation level in the country (Lenka & Bairwa, 2016; Tule & Oduh, 2017).

Similarly, while explaining the relationship between finance and unemployment, scholars, like Aportela (1999), found that bank accounts increase saving. Similarly, other researchers like Dupas and Robinson (2009) find that saving accounts in a bank affect positively productive investment, which ultimately helps to create employment opportunities in the economy. Studies also suggest that financial inclusion also facilitates business start-ups (Klapper et al., 2006; Banerjee et al., 2015). Likewise, other researchers have also tried to investigate the cause-and-effect relationship between financial sector development and unemployment rate in different economic contexts (for example Aliero et al., 2013; Bayar, 2016; Epstein & Shapiro, 2019; Ajide, 2020; Ibrahiem & Sameh, 2020; Chen et al., 2021). Among all the studies conducted with context to financial development and unemployment, some of the studies have found significant relationships between the two variables (Shabbier et al., 2012; Aliero et al., 2013; Epstein et al., 2019). On the other hand, other studies found no significant relationship between these two variables (Bayar, 2016).

Throughout our journey of literature, we observed that there are a handful of studies that exist with context to financial development and unemployment. However, we realized a dearth of studies conducted with a focus on financial inclusion. With the rise in unemployment across the globe, the role of financial accessibility has to be properly examined. Though we found few studies between financial inclusion and unemployment (Molefhi, 2019; Blancher et al., 2019; Okoro et al., 2020; Mehry et al., 2021), its presence in the literature is insufficient. Further, it has been rarely tested empirically in a cross-country context. Blancher et al., (2019) conducted a study on a cross-country basis (i.e., the Middle East and Central Asia); however, in that study, the authors endeavoured to examine the relationship between financial inclusion and small and medium-scale enterprises. From our literature review process, we did not find any study depicting the impact of financial inclusion on unemployment in a cross-country context.

Hence, the current study differs from the earlier studies in four major ways. Firstly, this study is exploring the relationship between financial inclusion and unemployment among the selected upper and lower middle-income countries separately. Secondly, this study uses a wide range of indicators for constructing a composite Financial Inclusion Index (FII). Thirdly, unlike earlier studies, this study uses the Principal Component Analysis (PCA) method to construct indexes of financial inclusion separately for both groups of countries (i.e., upper- and lower-middle-income countries).

And fourthly, this study uses a nonlinear term of financial inclusion (i.e., FII^2) to ensure an evaluation of the threshold level of financial inclusion in both groups of countries.

4. Data and Econometrics Analysis Techniques

4.1 Variable Specification and Data Sources

Here, we discuss the number of variables that were used in this study and their diverse data sources. To empirically examine the effect of financial inclusion on unemployment rate in both UMI and LMI countries, this study considered 31 countries from both categories of countries, covering the time period from 2004 to 2019. Out of these total 31 countries, this study took 16 countries from the upper-middle-income (UMI) groups, and the rest of the 15 countries were chosen from the lower-middle-income (LMI) categories (see Table A3 in the Appendix). For a division of countries on an income basis, this study relied on the World Bank income-based classification of countries for the 2021 fiscal year.

4.1.1 Unemployment (% of total labour force)

The total number of unemployed people includes the number of unemployed people by both gender groups (i.e., male and female). The cross-country unemployment data for 31 countries was gathered from World Bank Database. The trend of unemployment for both groups of countries is provided in Figures B3 and B4 in the Appendix. Furthermore, for both groups of countries, the periodical trend (i.e., 2004, 2014, 2018) of unemployment is presented in Figures B3 and B4 to know the current status of unemployment in these countries (see Figures B3 and B4 in the Appendix). For conducting the empirical analysis, the unemployment rate is used on the dependent variable side across the three regression models (i.e., overall sample, UMI and LMI).

4.1.2 Financial Inclusion Index

As the process of financial inclusion involves various dimensions of financial availability, accessibility, and usability, collecting data from all these dimensions and constructing a single index is always a great challenge for the researchers. While going through our literature journey, it was found that the financial inclusion index is constructed by different researchers at various points in time, as per the availability and suitability of the data. In this study, we considered six diverse financial inclusion indicators covering three major dimensions of financial inclusion (i.e., demographic dimension, geographic dimension, and usage dimension). In the demographic dimension section, we considered the number of bank branches and the number of ATMs per 100,000 adult population. Similarly, in the geographic section, we chose the number of commercial bank branches and the number of ATMs per 1000 km². Likewise, for measuring the usage of financial inclusion, we took outstanding deposits and credit as a percentage of GDP. All these indicators were used by Lenka and Barik (2018) and Barik and Lenka (2023) in their financial inclusion index calculations. All the indicators of financial inclusion are collected from the financial access survey of the International Monetary Fund (IMF).

For constructing a single financial inclusion index, this study relied on the statistical procedure for the construction of weights for the factors, i.e., the Principal

Component Analysis (PCA)³ method. Using the PCA method, financial inclusion indexes for all 31 countries (16 countries for UMI and 15 countries for LMI) from both income groups were calculated. The figures of the estimated financial inclusion indexes for both groups of countries are presented in Figures B1 and B2 in the Appendix. Additionally, to understand the trend and current status of financial inclusion in these selected countries, periodical trends (i.e., 2004, 2014 and 2018) of financial inclusion are also presented in the same figures (see Figures B1 and B2).

4.1.3 Control Variables

This study used five control variables. Such variables are remittance receive as a percentage of county's GDP, GDP per capita, FDI inflow, Corruption Perception Index (CPI), and the rate of inflation. Except for CPI, all other control variables were collected from World Bank indicators. The CPI data was gathered from Transparency International (TI). The following Table shows the number of variables used in this study, their description, and their data sources.

³ We first calculated the factor scores (weights) through their eigenvalues. Then we calculated the factor score (weights) of each variable and multiplied it with the respective original variable. Finally, we add them together to get the single value of the composite index for i^{th} state for a particular time period t . Hence, for constructing a single index of financial inclusion, the formula is expressed as:

$$FII_{it} = \sum_{i=1}^p w_{ji} X_{pi}$$

By expanding this equation, it can be expressed as:

$$FII_{it} = W_{i1}X_1 + W_{i2}X_2 + W_{i3}X_3 + \dots + W_{ip}X_p$$

FII_{it} is the financial inclusion index; W_i is the weight of the factor coefficient, X is the respective original value of the component, and p is the number of variables used. The financial inclusion index for all the countries is calculated by adding together the entire factor scores (weights) and their respective original values. FII_{it} is the financial inclusion index of i^{th} state for the time period t and W_2, W_2, \dots, W_6 are the weights of different factor scores.

Table 1: Description of Variables

Variables	Explanation	Data Sources
<u>Dependent Variable</u> Rate of Unemployment	Percentage of Unemployment	World Bank Indicators (WDI)
<u>Independent Variable</u> Financial Inclusion index (FII)	(a) Number of bank branches per 100,000 adult population. (b) Number of ATMs per 100,000 adult population. (c) Number of bank branches per 1000 KM ² . (d) Number of ATMs per 1000 KM ² . (e/f) Outstanding deposit and credit as a percentage of GDP	Financial Access Survey of International Monetary Fund (2020)
<u>Control Variables</u> (a) REM (Remittance) (b) GDPPC (GDP Per Capita) (c) FDI (Foreign Direct Investment) (d) Corruption Perception Index (CPI) (e) INF (Inflation)	(a) Received Remittance % of GDP (b) Gross Domestic Product Per Capita (c) Net Inflow of FDI (% of GDP) (d) Measure the perception of corruption in the public sector. (e) Rate of Inflation	(a) WDI (2020) (b) WDI (2020) (c) WDI (2020) (d) Transparency International (2020) (e) WDI (2020)

Source: Authors Preparation

4.2 Empirical Models Specification

The main purpose of this paper is to investigate how the process of financial inclusion has impacted the unemployment condition in upper and lower-middle-income countries. In order to execute the above-cited objective, the following econometric model is specified:

$$UNMP_{it} = \alpha_0 + \beta_1 FII_{it} + \beta_2 CTRL_{it} + \mu_{it} \tag{1}$$

By expanding the control variables in eq. 1, the above equation can be written in the following manner:

$$UNMP_{it} = \alpha_0 + \beta_1 FII_{it} + \beta_2 REM_{it} + \beta_3 GDPPC_{it} + \beta_4 FDI_{it} + \beta_5 CPI_{it} + \beta_6 INF_{it} + \mu_{it} \tag{2}$$

In the above equation, UNMP refers to the rate of unemployment, which is used as a dependent variable in the model. Correspondingly, the term FII indicates the financial inclusion index, and it is used on the independent variable side of our econometric model. Furthermore, along with this main independent variable (i.e., FII), this study also uses some control variables, which include Received Remittance as a % of GDP (REM), Per Capita Gross Domestic Product (GDPPC), FDI inflow (FDI), Corruption Perception Index (CPI) and Rate of Inflation (INF). Lastly, the term μ_{it} refers to the error term in the model. The subscript (i, t) denotes the cross-sectional and time dimensions of the

panel. That means the term i refers to the number of countries (i.e., 1, 2, 3...31) and t indicates the time period (i.e., 2004, 2005, 2006...2019).

All the selected control variables have a significant relationship with the dependent variable (i.e., rate of unemployment). Control variables like REM and GDPPC have an important connection with the rate of unemployment. The huge inflow of remittances to the economy and the rise in per capita income can encourage people to invest their money in small and medium-scale enterprises, which will ultimately reduce the level of unemployment in the economy. Likewise, the larger inflow of remittances would boost economic growth (Meyer & Shera, 2017; Kadozi, 2019), and economic growth, on the other hand, would help to reduce the rate of unemployment in the economy (Abbas, 2014; Banda et al., 2016). Similarly, the inflow of more FDI can also contribute to the reduction of the unemployment rate in the economy. With the huge rise in FDI inflow, the host country increases its investment, which ultimately helps to reduce the level of unemployment in the economy (Strat et al., 2015; EStrin, 2017). Hence, it is expected that the FDI will have a negative impact on the rate of unemployment. Likewise, it is expected that the development of corruption will increase unemployment. Because the presence of high corruption in the system encourages inefficient youth to obtain jobs by giving bribes to the officers, this leads to resource diversion and more unemployment among the educated youth (Bouzid, 2016; Adjor & Kebalo, 2018). Correspondingly, the rate of inflation has a close relationship with the unemployment rate. The rate of high inflation can create an unstable economy, which will negatively impact the rate of unemployment (Phillips, 1958; Berentsen et al., 2011).

Furthermore, the study has used a nonlinear term of financial inclusion (i.e., FII^2) to ensure an evaluation of the threshold level of financial inclusion on the unemployment rate in the overall (that includes both UMI and LMI countries) estimation and separately for UMI and LMI countries as well. Because of the wide variation in the socio-economic characteristics and economic policy variations, the degree of financial inclusion has a very non-monotonic nature of progress in these two categories of countries. In other words, it can be explained that there are large differences in socio-economic lifestyles and institutional policy variations between these two categories of nations. These fundamental differences can yield a very unequal distribution of financial services among the peoples of these two categories of nations. Therefore, in order to know how the variability of financial inclusion responds differently to the unemployment problem, the study used the threshold level of financial inclusion (FII^2) as an independent variable along with the baseline financial inclusion index (FII). Thus, using the threshold level of financial inclusion, the econometric model can be further explained in the succeeding method.

$$UNMP_{it} = \alpha_0 + \beta_1 FII_{it} + \beta_2 FII^2_{it} + \beta_3 REM_{it} + \beta_4 GDPPC_{it} + \beta_5 FDI_{it} + \beta_6 CPI_{it} + \beta_7 INF_{it} + \mu_{it} \quad (3)$$

4.2.1 Estimating Techniques

Firstly, the study used both fixed effect and random effect models to measure the impact of financial inclusion on unemployment. Though panel data are mainly based on two dimensions, i.e., time and cross-sectional dimensions, there might be an issue of autocorrelation and heteroscedasticity in the dataset. To take care of these issues, the study employs Panel Corrected Standard Errors (PCSEs) and Feasible General Least Square Method (FGLS) for the robustness of the results. At the end, both PCSEs and FGLS are not sufficient to solve the issue of endogeneity or any potential problem of

variable omission. To overcome these problems, the study relies on the System Dynamic Panel model.

5. Empirical Results and Discussions

The prime objective of this study is to empirically scrutinise the effect of financial inclusion on unemployment among the 31 selected UMI and LMI countries for the period of 2004 to 2019. In order to execute this idea, the study tries to estimate three different regressions. First, the study empirically examined the effect of financial inclusion on unemployment by taking the whole 31 countries. This study further segregated the data into two different country groups, i.e., UMI and LMI countries, and examined the same objective differently among these two categories of nations. The main purpose of doing separate regressions for two separate categories of nations is to understand if any regional characteristics have impacted the outcomes differently. Because two categories of nations (i.e., UMI and LMI) have different social, economic, and institutional setups in their respective regions. Moreover, while segregating the whole dataset into two different categories (based on the World Bank classification), we selected 16 countries for UMI countries, and the rest 15 countries were used for LMI countries.

5.1 Estimated Results of Financial Inclusion and Unemployment: for Full Sample Countries and Upper Middle-Income Countries:

Before going to a fuller description of the estimated empirical results, the study presented the overall descriptive statistics in Tables A1 and A2 in the Appendix. There are a total of 465 observations used in this analysis. The correlation results (see Table A2 in the Appendix) show the overall correlation between all the variables. The overall correlation results depict that the initial level of financial inclusion (i.e., FIINDEX) has a positive relationship with the rate of unemployment. However, after surpassing a threshold level, the non-linear term of financial inclusion (i.e., FII²) has a negative relationship with the rate of unemployment. Similarly, the correlation results of the five control variables show that variables like Remittance Inflow (REM), GDP Per Capita (GDPPC), and FDI Inflow have a negative relationship with the rate of unemployment, whereas the other two variables, such as Inflation (INF) and Corruption Perception Index (CPI) have a positive correlation with the rate of unemployment (see Table A2 in the Appendix).

Table 2: Impact of Financial Inclusion on Unemployment: Full Sample
Dependent Variable: Unemployment

Variable	OLS	FE	RE	PCSE	FGLS	System Dynamic Panel
FII	0.060* (0.0354)	-0.0219 (0.0409)	-0.0314 (0.0377)	0.0604 * (0.0349)	0.0604* (0.0351)	0.0302*** (0.0087)
FII ²	- 0.0009*** (0.0003)	0.0009 (0.0003)	0.0001 (0.0002)	- 0.0009*** (0.0003)	- 0.0009*** (0.0003)	-0.0005*** (0.0008)
REM	-0.0403 (0.0549)	-0.0506 (0.0839)	-0.0596 (0.0773)	-0.0403 (0.0261)	-0.0401 (0.0545)	-0.1229*** (0.0100)
GDPPC	1.6543 (1.2420)	2.7458 (3.0529)	3.1997 (2.4723)	- 1.6543*** (0.5478)	-1.6543 (1.2317)	-4.2035*** (0.3836)

Variable	OLS	FE	RE	PCSE	FGLS	System Dynamic Panel
FDI	-0.1357 (0.0866)	- 0.3201*** (0.0566)	- .3114*** (0.0558)	-0.1357 (0.0892)	-0.1357 (0.0858)	-0.0299*** (0.0112)
INF	0.0879* (0.0493)	-0.0118 (0.0319)	-0.0044 (0.0315)	0.0879*** (0.0285)	0.0879* (0.0488)	0.0088 (0.0073)
CPI	2.7922*** (0.3637)	-0.3259 (0.4288)	-0.0691 (0.4048)	2.7922*** (0.3473)	2.7922*** (0.3594)	0.7717*** (0.1429)
C	-8.6041**	-0.2095 (10.8695)	-2.5361 (8.8368)	-8.6041** (1.9498)	-8.6041* (4.2983)	13.8222*** (0.8329)
Observation	465	465	465	465	465	465
R-square	0.1819	0.0858	0.0845	0.1819		
F-statistics	14.52	5.72				
Prob. (F-statistics)	0.0000	0.0000				
Wald chi2			39.55	650.80	103.41	19877.59
Prob > chi2			0.0000	0.0000	0.0000	0.0000
Hausman test			10.41			
Log likelihood					-1432.917	
No. of countries	31	31	31	31	31	31

Source: Author’s Estimation, Note: Standard errors in parentheses. *p < .10, **p < .05, ***p < .01

Table 3: Impact of Financial Inclusion on Unemployment: Upper Middle Countries (UMCs), Dependent Variable: Unemployment

Variable	OLS	FE	RE	PCSE	FGLS	System Dynamic Panel
FII	0.2516*** (0.0508)	-0.1368* (0.0552)	-0.1108* (0.0529)	0.2516*** (0.0736)	0.2516*** (0.0499)	0.0619* (0.0245)
FII ²	-.0024*** (0.0005)	0.0007* (0.0004)	0.0006 (0.0004)	-0.0023*** (0.0007)	-0.0024*** (0.0005)	-0.0008*** (0.0002)
REM	0.2152 (0.1432)	- 1.5948*** (0.3185)	- 0.9176*** (0.2641)	0.21512* (0.0877)	0.2152 (0.1407)	-0.2095* (0.0893)
GDPPC	1.3502 (3.0372)	6.9409 (4.7825)	3.9509 (4.3731)	1.3502 (1.0769)	1.3502 (2.9862)	-10.7497*** (2.7166)
FDI	-0.1923 (0.1202)	-.2237*** (0.0796)	- 0.2619*** (0.0827)	-0.1923 (0.1398)	-0.1923 (0.1182)	0.0393 (0.0311)
INF	0.3338* (0.1284)	-.2328*** (0.0798)	-.1951* (0.0837)	0.3338*** (0.0988)	0.3338*** (0.1262)	-0.0063 (0.0329)
CPI	4.8722*** (0.5217)	-0.8548 (0.6523)	-0.0388 (0.6342)	4.8722*** (0.6877)	4.8722*** (0.5128)	1.1728*** (0.2542)
C	-21.1707* (12.3458)	-7.2509 (18.2537)	-0.2953 (16.8788)	- 21.1708*** (6.1955)	-21.1707* (12.1383)	40.8024*** (10.5274)
Observation	240	240	240	240	240	240
R-square	0.3260	0.2537	0.2381	0.3260		
F-statistics	16.03	10.54				

Variable	OLS	FE	RE	PCSE	FGLS	System Dynamic Panel
Prob. (F-statistics)	0.0000	0.0000				
Wald chi2			52.09	74.95	116.08	2759.36
Prob > chi2			0.0000	0.0000	0.0000	0.0000
Hausman test			9.26			
Log likelihood					-761.6465	
No. of countries	16	16	16	16	16	16

Source: Author’s Estimation, Note: Standard errors in parentheses. *p < .10, **p < .05, ***p<.01

The regression results for the overall full sample countries (that includes both UMI and LMI) and UMI countries separately are presented in Tables 2 and 3. The main two predictors (i.e., FII and FII²) for both the sample country groups, i.e., overall sample countries and UMI countries, depict similar kind, of results. Hence, the interpretation of the main predictor results for both sample countries is the same.

From both sample group countries (i.e., overall sample countries and UMI countries), the results show that the initial level of financial inclusion (i.e., FII) has a positive effect on the rate of unemployment. In both sample groups, the basic OLS result depicts a positive sign; Fixed Effect (FE) and Random Effect (RE) models shows a negative sign; whereas after controlling for problems of autocorrelation, heteroscedasticity, and endogeneity, the estimated results of the higher models (i.e., PCSE, FGLS and System Dynamic Panel) show a positive impact of baseline financial inclusion on the rate of unemployment.

Similarly, the FII² results for both sample groups of countries show that after surpassing a threshold level of financial inclusion, it has a negative and significant impact on the rate of unemployment. Unlike FII, the threshold results show that the basic OLS has a negative sign and FE and RE have a positive sign. However, after solving the issues of autocorrelation, heteroscedasticity, and endogeneity, the study finds a negative sign in the higher model. Hence, the result here is interpreted as per the findings from the higher models.

Both results (FII and FII²) indicate that the initial level of financial inclusion only allows people to open a deposit and savings account, which in any form does not help to reduce the rate of unemployment in the country. With the basic level of financial services, people only do their day-to-day transactions, i.e., save money in the bank or withdraw money from the bank. However, after surpassing the baseline degree of financial inclusion, it has a downside effect on the rate of unemployment. This result clearly indicates that, after the threshold degree, more intensification of financial accessibility and usability can help to reduce the degree of unemployment in the economy. This is quite possible in the real economy because the greater intensification of financial inclusion allows people to obtain more credit from financial institutions, enable them to use various digital technologies for their business transactions, extend higher degree of financial literacy, and also provide various investment or business planning services to the people. The greater accessibility of bank credit provokes people to invest that obtained credit in various business plans, which ultimately helps to boost small-scale industries and reduce the degree of unemployment in the economy. Similarly, the frequent use of various digital technologies for business transactions can speed up business activities and help grow the business, which in turn helps generate more employment and reduce the degree of unemployment in the economy. Correspondingly,

with the strengthening degree of financial inclusion, financial literacy and various financial plans are also extended to the people with their better management of financial resources. These literacy programmes and financial plans would surely assist people for their financial investments in various businesses. All these activities will help boost business activities in the economy, which will eventually reduce the rate of unemployment in the country. Therefore, after reaching the threshold level of financial inclusion, it has a negative effect on the rate of unemployment.

The results from the control variables depict that the rate of remittance inflow (REM) and GDP Per Capita (GDPPC) negatively impact the rate of unemployment in both the sample country groups (i.e., full sample and UMI). With context to the inflow of Foreign Direct Investment (FDI), it has a negative impact for the full sample countries, whereas it has a positive impact in the case of UMI countries. Other two control variables, such as the rate of Inflation (INF) and Corruption Perception Index (CPI) have a positive effect on the rate of unemployment in both sample group countries.

The inflow of remittances can impact the rate of unemployment both negatively and positively (Amuedo-Dorantes, 2014). In one way, the heavy inflow of remittances can promote a culture of dependency in the receiving country, lowering labour force participation, promoting conspicuous consumption, and slowing economic growth. On the other hand, remittance inflow can reduce the degree of poverty, provide opportunities for entrepreneurs, create employment, and boost the economy (Orrenius et al., 2010). This study found a negative effect of remittances on the rate of unemployment. That means the inflow of remittances helps entrepreneurial activity, which generates more employment and reduces the rate of unemployment in the country for both sample countries. Similarly, the result of GDP Per Capita indicates that the rise in per capita income would reduce the level of poverty and induce the individuals to spend money their health, education and skill training which will eventually boost the productivity capacity of an individual and encourage to participate in the labour market.

However, FDI inflow differently impacts the two sample group countries. The FDI inflow negatively impacts the rate of unemployment in the full sample of countries, whereas in the case of only UMI countries, FDI positively impacts the rate of unemployment. This may be possible because UMI countries must have a high standard of living, a higher presence of industry, stable economic growth, and a better employment position. As a result, the extra inflow of FDI into the economy does not have enough potential to impact the rate of unemployment in the economy. That is why FDI inflow in UMI countries does not help reduce the rate of unemployment. Likewise, other two variables, such as INF and CPI, have positive impact on unemployment in both the sample group countries. It can be said that the presence of high inflation creates economic instability, which may cause negative employment generation (Berentsen et al., 2011). Similarly, the high persistence of corruption in the system can allow less efficient people to obtain jobs by giving bribes to the office and can discourage other efficient workers from participating in the labour market.

5.2 Estimated Results of Financial Inclusion and Unemployment: for Lower Middle-Income Countries (LMI)

The present section demonstrates the results of financial inclusion and unemployment in lower-middle-income (LMI) countries. Like the previous two sections (i.e., full sample groups and UMI countries), we depicted the threshold level impact of financial inclusion on the rate of unemployment along with its baseline results. However, unlike the two previous results, we found a contrast results for LMI countries. Both the baseline (FII) and threshold (FII²) results for LMI countries depict a positive sign of

financial inclusion on unemployment. In the case of the baseline result, the initial OLS has a negative sign, FE and RE have a positive sign (see Table 4). Realizing the time and cross-sectional dimensions of the panel dataset and expecting the presence of autocorrelation and heteroscedasticity in the data, the study used PCSEs and FGLS for the robustness of the results. Both of these models have a negative sign for LMI. However, as both PCSEs and FGLS are not sufficient to solve the issue of endogeneity or any potential problem of a variable omission, the study finally relied on the System Dynamic Panel model. The final result of the System Dynamic Panel model shows a positive sign of financial inclusion in the rate of unemployment. Hence, the result is interpreted as per the final estimation of System Dynamic Panel model. Similarly, in the case of threshold level financial inclusion (FII²), the initial OLS has a positive sign, and FE and RE have a negative sign. However, after controlling for the problem of autocorrelation, heteroscedasticity, and the issue of heteroscedasticity, the study finds a positive sign. That means that in the case of the LMI countries, both the baseline and threshold levels of financial inclusion does not have any impact on reducing the rate of unemployment. These findings further indicate that in the case of LMI countries, neither the basic accessibility of financial inclusion nor the intensification of financial services helps reduce the rate of unemployment in the economy. This is quite possible because in LMI countries with poor institutional quality and weak organizational structures, it is quite difficult to transform bank credit into employment generation. In LMI countries, even if people receive formal loans from the bank, because of low financial knowledge, weak financial planning, and poor institutional and organizational quality, people face difficulty converting that credit into employment creation through establishing small and medium-scale enterprises. Similarly, though the threshold level of financial inclusion allows for the usage of various digital payment technologies for conducting various business activities, due to a less techno-friendly business environment, less knowledge of digital payment methods, and the low availability of the internet or network, the digital technology also does not help boost business transactions, which ultimately creates constraints for the growth of businesses. As a result of all these factors, both the baseline and threshold levels of financial inclusion produce no fruitful results to reduce the rate of unemployment in LMI countries.

Table 4: Impact of Financial Inclusion on Unemployment: Lower Middle Countries (LMCs), Dependent Variable: Unemployment

Variable	OLS	FE	RE	PCSE	FGLS	System Dynamic Panel
FII	-0.4214*** (0.0599)	0.3158** * (0.0762)	0.2002** * (0.0728)	-0.4214*** (0.0564)	-0.4214*** (0.0589)	0.0068 (0.1148)
FII ²	0.0037*** (0.0007)	- 0.0029** * (0.0007)	- 0.0019** * (0.0007)	0.0037*** (0.0006)	0.0037*** (0.0006)	0.0006 (0.0008)
REM	0.0316 (0.0447)	0.0577 (0.0674)	0.0161 (0.0634)	0.0316 (0.0216)	0.0316 (0.0439)	-0.0638 (0.1265)
GDPPC	14.4071** * (1.8101)	-4.3325 (3.5029)	-0.4524 (3.1716)	14.4071** * (1.0893)	14.4071** * (1.7776)	-0.8867 (3.2266)

Variable	OLS	FE	RE	PCSE	FGLS	System Dynamic Panel
FDI	0.0655 (0.1048)	- 0.2346** * (0.0778)	-0.1945* (0.0785)	0.0655 (0.0844)	0.0655 (0.1029)	-0.1295* (0.0506)
INF	-0.0029 (0.0373)	0.0161 (0.0263)	0.0272 (0.0264)	-0.0029 (0.0386)	-0.0029 (0.0366)	0.0417** * (0.0111)
CPI	-0.1762 (0.4493)	-1.0401* (0.4873)	-0.8637* (0.4703)	-0.1762 (0.3876)	-0.1762 (0.4413)	0.9625** * (0.2308)
C	- 37.3676** * (5.5072)	19.6861* (11.3699)	7.4343 (10.2831)	- 37.3676** * (3.0935)	- 37.3676** * (5.4084)	90.3965* (45.7692)
Observation	225	225	225	225	225	225
R-square	0.3165	0.3274	0.1965	0.3165		
F-statistics	14.35	4.10				
Prob. (F-statistics)	0.0000	0.0003				
Wald chi2			17.95	398.06	104.19	4490.27
Prob > chi2			0.0122	0.0000	0.0000	0.0000
Hausman test			48.24			
Log likelihood					-592.779	
Durbin(score)						
) chi2(1)						
Wu-Hausman F						
(1,457)						
No. of countries	15	15	15	15	15	15

Source: Author’s Estimation, Note: Standard errors in parentheses. *p < .10, **p < .05, ***p<.01

The results of the control variables for LMI countries are quite similar to the control variable findings of full sample country groups. Control variables, such as Remittance Inflow (REM), GDP Per Capita (GDPPC) and the inflow of FDI, negatively impacts the rate of unemployment in LMI countries. Unlike the UMI group countries, the inflow of FDI negatively impacts the unemployment rate (see Table 4). This may be possible because LMI countries are undeveloped or underdeveloped by their economic status, hence, the inflow of extra FDI might assist the economy to boost the manufacturing industry, which might create more employment for the people. As a result of that, FDI inflow helps reduce the rate of unemployment in the economy. However, the other two control variables, such as the rate of inflation (INF) and corruption perception index (CPI), have a positive sign. That means the economic instability caused by inflation and the presence of high corruption in the system do not help reduce the rate of unemployment in the economy.

6. Concluding Remarks

Most countries around the world have seen an unprecedented rise in unemployment in recent years. Specifically, the recent escalation of Covid-19 virus has aggravated the problem of unemployment in every country. In this context, an obvious question can be asked, what is the role of financial inclusion for solving the problem of unemployment? Can an easy and affordable access to finance be used as a panacea for unemployment problem?

In order to answer this question, here the study endeavours to empirically examine how has the process of financial inclusion helped to reduce the rate of unemployment. Furthermore, to understand the dynamic relationship between these variables, the study further segregated its analysis into two categories of nations (i.e., UMI and LMI) and two degrees of financial inclusion (i.e., baseline and threshold level). The baseline level of financial inclusion is indicated as FII and the threshold level is indicated as FII². The main objective of two categorization of the degree of financial inclusion is to see how the degree of financial inclusion impacting differently for two dissimilar categories of nations. Thus, to empirically examine the relationship between two above cited variables (i.e., financial inclusion and unemployment), this study has considered 31 countries from both UMI and LMI categories, covering the period from 2004 to 2019. The estimated results of this study depict that in the overall sample countries (that include both UMI and LMI) and UMI sample countries, financial inclusion at the baseline level is not having any impact for reducing the rate of unemployment. However, after a certain level, with the more intensification of financial inclusion, it has very negative impact on the rate of unemployment. That means more intensification of financial inclusion helps to reduce the rate of unemployment in the overall and UMI sample countries. On the contrary, the results from the LMI countries shows that neither at initial level nor at the intensification level, financial inclusion does not have any impact on the reduction of unemployment rate.

7. Policy Implications

Based on our empirical findings, this study takes an opportunity to propose some valuable policy suggestions to the policy makers. The estimated results show that in the case of UMI countries, an extension of financial inclusion beyond basic financial accessibility significantly impacts the reduction in unemployment. These results demonstrate that the enhancement of the magnitude of financial inclusion can be an imperative policy measure to reduce unemployment among the UMI countries. However, in the case of LMI countries, the empirical findings suggest that financial inclusion does not impact the rate of unemployment neither at the baseline level nor at the surpass of threshold level. This result indicates that in order to make financial inclusion more effective to reduce unemployment, countries from LMI countries must pay attention to enhance their organizational skills, institutional quality, financial plan and implement stringent monitoring guidelines along with financial inclusion. Otherwise, financial inclusion alone will not be much competent to solve the problem of unemployment in those countries.

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Appendix

Table A1: Summery Statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
UNMP	465	7.332232	5.836214	-10.4974	30.91959
FIINDEX	465	43.6712	27.37524	3.716863	100
FI ²	465	2654.966	3246.446	13.81507	15474.83
REM	465	4.650598	5.23452	.0932936	34.499
GDPPC	465	3.915394	.2964055	3.168833	4.450265
FDI	465	3.38663	3.052295	-.2045323	31.24253
INF	465	6.419217	5.359475	-2.4095	48.69986
CPI	465	3.373118	.8114137	1.5	5.9

Source: Authors' Estimation

Table A2: Correlation Metrix

Variable	UNMP	FIINDEX	FI ²	REM	GDP	FDI	INF	CPI
UNMP	1.0000							
FIINDEX	0.0718	1.0000						
FI ²	-0.1023	0.9573	1.0000					
REM	-0.1246	0.1185	0.1690	1.0000				
GDPPC	-0.1562	0.5739	0.5183	-0.4078	1.0000			
FDI	-0.0289	0.1363	0.1613	0.0199	0.1288	1.0000		
INF	0.0329	-0.1505	-0.1761	0.0521	-0.1361	0.2107	1.0000	
CPI	0.3248	0.3047	0.3325	-0.2897	0.4841	0.1578	-0.1795	1.0000

Source: Authors' Estimation

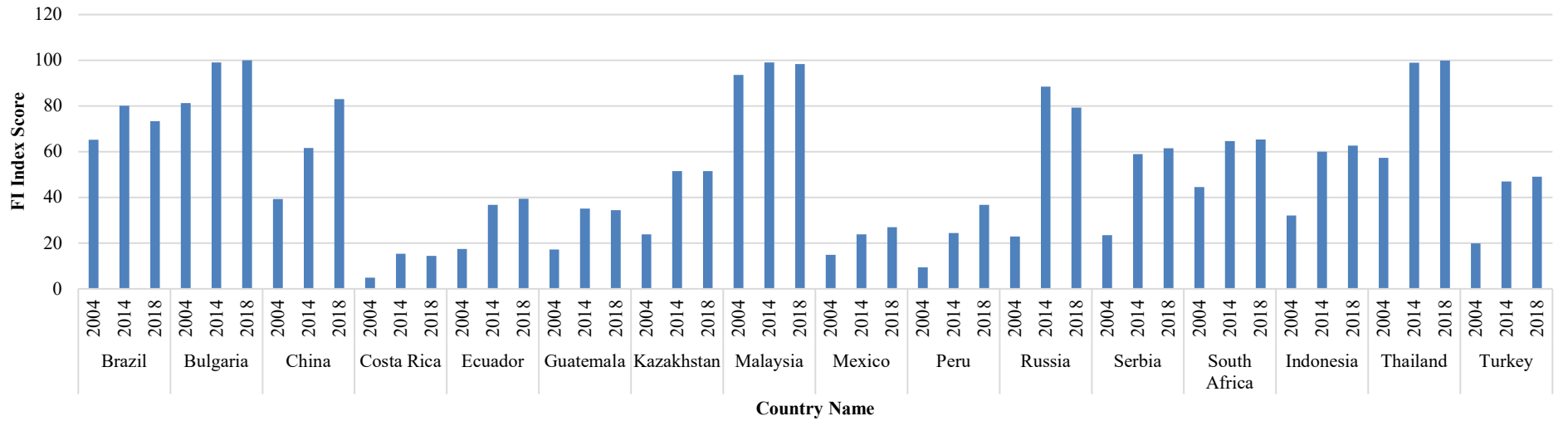
Table A3: List of Countries Considered for this Study

Sl. No	WB Classification	Country	Sl. No	WB Classification	Country
1	UMIC	Brazil	17	LMIC	Moldova
2	UMIC	Bulgaria	18	LMIC	Egypt
3	UMIC	China	19	LMIC	India
4	UMIC	Costa Rica	20	LMIC	Kenya
5	UMIC	Ecuador	21	LMIC	Morocco
6	UMIC	Guatemala	22	LMIC	Pakistan
7	UMIC	Kazakhstan	23	LMIC	Philippines
8	UMIC	Malaysia	24	LMIC	Tunisia
9	UMIC	Mexico	25	LMIC	Ukraine
10	UMIC	Peru	26	LMIC	Vietnam
11	UMIC	Russia	27	LMIC	Zambia
12	UMIC	Serbia	28	LMIC	Zimbabwe
13	UMIC	South Africa	29	LMIC	Bangladesh
14	UMIC	Indonesia	30	LMIC	Ghana
15	UMIC	Thailand	31	LMIC	Sri Lanka
16	UMIC	Turkey			

Source: Authors' Estimation

Figure B1

FI Index among UMI countries



Source: Authors' Preparation

Figure B2

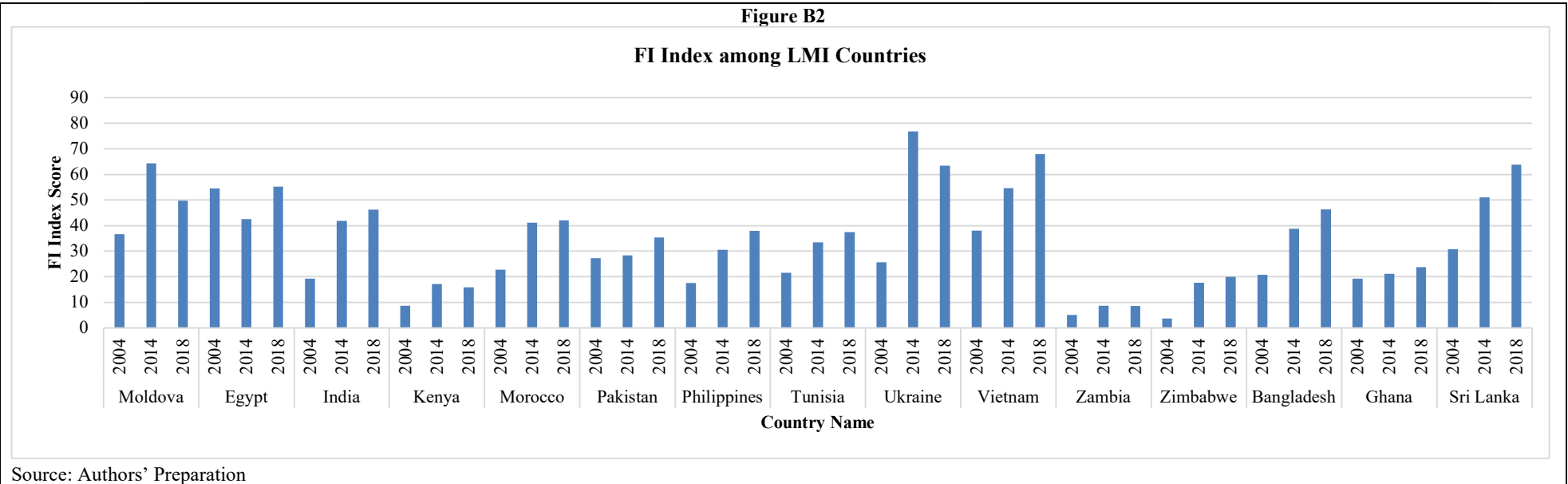
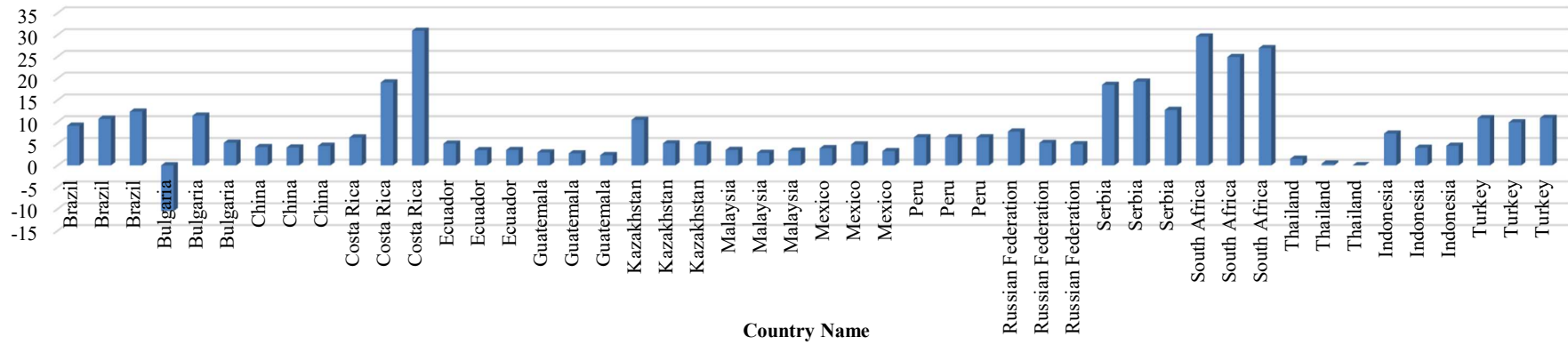


Figure B3

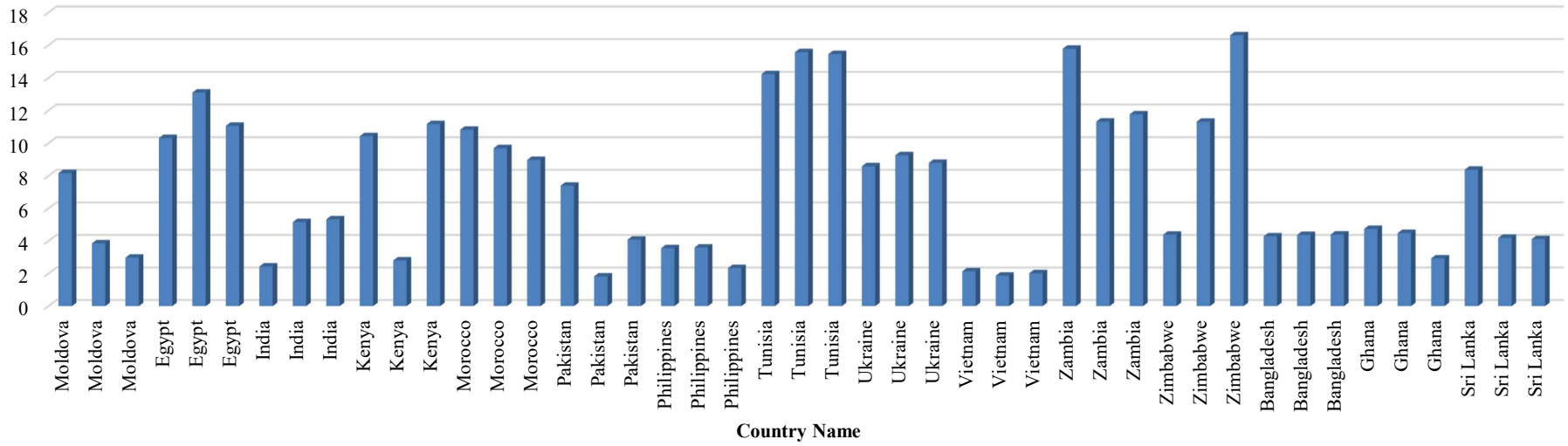
Rate of Unemployment in UMI Countries



Source: Authors' Preparation

Figure B4

Rate of Unemployment in LMI countries



Source: Authors' Preparation