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RESEARCH ARTICLE

Does Unemployment Affect Banking Performance? A Case Study of Indian Commercial Banks

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ABSTRACT

This study attempts to examine whether unemployment has any role in influencing the performance of commercial banks in India. Taking the data of all public and private sector commercial banks which were continuously in operation over the period from 2001 to 2017, we have attempted to investigate the influence of unemployment on the performance of Indian banking sector. We have considered return on equity and net interest margin as the measure of banking performance, unemployment as the focused independent variable, asset quality, operating efficiency, quality of loan as the bank-specific control variables and gross domestic product, inflation and unemployment as the macroeconomic control variables for this study. Applying GMM estimation method developed by Arellano and Bover we have tried to observe whether unemployment leave any impact on banking performance of India. Estimation results suggest that unemployment has significant positive association with banking performance and this result remains unchanged with the sequential inclusion of bank-specific and macroeconomic control variables. All the bank specific control variables exert significant negative influence on the banking performance whereas in case of macroeconomic control variables we observe mixed findings. The results arrived in this study have profound implications in formulating suitable policy decisions for the growth and development of the Indian banking sector.

Keywords: Indian Commercial Banks, Banking performance, Unemployment, Bank-Specific and Macroeconomic Control Variables, GMM Estimation Technique

1. Introduction.

Mass poverty and unemployment are the two basic challenges before most of the developing economies of the world. India is no exception. Even after seventy-five years of independence, these two curses are still haunting the policy makers of the country. Apart from the evil consequences of unemployment in the growth and development of the Indian economy, problem of unemployment has now become a political issue in Indian subcontinent. The problem has become so severe that the Government of India even in its recent budget placed on 22nd July, 24, has emphasised on creating employment opportunities to relieve the distress of the unemployed. According to International Labour Organization's (ILO) modelled estimates and projection

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database (accessed from World Bank data base on 21st July 2024), unemployment rate in India was 7.7 percent, 6.5 percent, 7.9 percent and 6.4 percent in the years 2018, 2019, 2020, and 2021 respectively (www.data.worldbank.org accessed on 21st July,2024). Though the percentage of unemployment has fallen below 5 percent in recent years but the number of unemployed people is really a cause of concern in meeting the objectives of inclusive development.

Unemployment may be defined as a situation when people in the working age group seeking employment at the available wage rate, fail to get employed. International Labour Organization defines unemployed people as those in the working age group who are available and seeking work but do not get any paid employment or self-employment(www.ilo.org accessed on 21st July,2024)Unemployment thus refers to the share of the total force without any work but available for and seeking employment at the prevailing wage rate (www.data.worldbank.org accessed on 21st July,2024). In the context of entitlement and capabilities, unemployed people are those who fail to exchange their own labour entitlement at the going wage rate (Sen [1]). In simple terms unemployment may be referred to as the situation where working age people seeking and available for employment at the going wage rate fails to get the same.

Whatever be the way, unemployment may be defined, it has many adverse consequences on the economy in general and on the people in particular. Unemployment deprives the people of their entitlement and leads to a reduction in their income and purchasing capacity (Sen [1]). Reduction in income and purchasing capacity of the people may adversely affect the growth of income in the economy and may further reduce the number jobs available for new entrants into the labour market. Unemployment may also have some impact on the subjective financial satisfaction of the people (Lee et.al [2]). Unemployment affects the wellbeing of both employed and unemployed. Unemployed suffers from the fear of remaining unemployed and this may adversely impact their occupational skills, may cause them to remain socially isolated which in turn leads to a reduction in their individual wellbeing and so also social welfare (Paul [3], Perovic [4]). Even employed people gets affected due to the prevalence of unemployment (Lee et.al [2]). Employed people may fear about losing their jobs which may negatively impacts their wellbeing (Green et.al [5]).

Thus, it is evident that unemployment has adverse consequences both on the affected and also on the unaffected people as well on the economy as a whole. Since situation of the economy has repercussions on its financial segment, unemployment may have some consequences on the performance of the banking system of the country. Though there are some works which takes unemployment as a macroeconomic performance driver of commercial banks (Horobet et.al [6], Sarkar and Rakshit [7,8]), there are almost no studies which examines the impact of unemployment alone in influencing the performance of commercial banks. This work attempts to bridge this gap in the existing research and attempts to examine the impact of unemployment on the profitability of Indian banking sector. Taking unemployment as the focused independent variable and some bank-specific (Asset Quality, Operating Efficiency, Quality of Loan) and macroeconomic control variables (Gross Domestic Product, Inflation, Cash with the people) we have tried to examine whether unemployment has any impact on the performance of Indian commercial banks. This work also attempts to investigate whether the impact of unemployment on banking performance undergoes any change due to sequential inclusion of bank-specific and macroeconomic control variables. This study may seem to be pioneer in the range of existing studies on banking sector performance and may add valuable insights into the domain of the existing knowledge.

The rest of the work is organised as follows. Section 2 presents the survey of existing literature, followed by the objectives of the study in section 3, data and methodology in section 4, estimation results in section 5 and conclusions in section 6.

2. Literature Survey.

Extant studies on banking sector performance determinants consider both bank-specific and internal factors and macroeconomic or external factors (Sarkar and Rakshit [9]). Among the macroeconomic factors GDP and inflation (Athanasoglou et al [10], Flamini et al [11], Ongore & Kusa [12], Dietrich & Wanzenried[13], Petria et al[14],Masood and Ashraf [15], Luft and Omarkhil [16] , Yahya et.al[17], Antoun et.al[18], Almaqtari et al[19]) are most commonly used in the existing studies. Some of other factors like lending interest rate (Rashid and Jabeen [20]), effective tax rate (Dietrich & Wanzenried[13]), exchange rate(Al-Homaidi et al [21]) are also used in the existing studies on banking sector performance determinants. These studies are based either on a single country (Athanasoglou et al [10], Dietrich & Wanzenried[22], Ćurak et al[23], Ongore & Kusa[12], Tan[24], Barua et.al[25], Robin et al[26], Sarkar &Rakshit[7-9]), or used cross country comparisons(Demigruc-Kunt & Huizinga[27], Kosmidou et.al[28],Pasiouras and Kosmidou[29], Flamini et al[11], Jara-Bertin et al[30], Căpraru & Ihnatov[31], Albulescu[32], Petria et al[14], Caporale et al[33], Le &Ngo[34]).

Though there are numerous studies across the world on the determinants of banking sector performance there are very few studies which consider unemployment as a macroeconomic performance driver (Sarkar &Rakshit [7]) of commercial banks. Only Horobet et.al [6], used unemployment rate as the performance determinant of commercial banks on Central and East European (CEE) countries while Sarkar and Rakshit [7,8], considered unemployment as a performance driver of Indian banking sector. In their study on banking sector of CEE countries Horobet et.al [6], find that unemployment has some negative impact on the profitability of the banking sector while Sarkar and Rakshit [7], found that unemployment has insignificant positive impact on the profitability (Return on assets, Return on equity and Net interest margin) of the Indian banking sector.

Though the studies which takes unemployment as macroeconomic performance determinants are really scanty there are some works which examine the impact of unemployment on the liquidity, non-performing loans, and credit risks of commercial banks. Impact of unemployment on the liquidity of commercial banks has been studied by Munteanu [35], Horváth [36]), on non-performing assets by Louzis et.al [37], Messai and Jouini [38], on credit risk by Vogiazas and Nikolaidou [39]. Messai and Jouini [38] found that non-performing loans vary positively with unemployment in the three countries Italy, Greece and Spain while Louzis et.al [37] found a strong impact of unemployment on the impaired loans of Greek banks. Vogiazas and Nikolaidou [39], observed that unemployment has a significant impact on the credit risk of the Romanian banking sector. In spite of relative non-availability of literature on the impact of unemployment on the banking sector performance there are works which examine the effect of banking stress on unemployment (Bernal-Verdugo et.al [40], Dijk et.al.[41]). Using a sample of ninety-seven countries over the period 1980-2008, Bernal-Verdugo et.al [40] found that banking crises have a profound negative impact on unemployment. Taking data of 38 developed countries of the world over the period from 1990 to 2014, Dijk et.al.[41], found that consequent on banking crises unemployment increases for all group of workers, however the effect is particularly more pronounced for younger workers.

Return on assets (ROA), Return on equity (ROE) and Net interest margin (NIM) are generally used as a measure of banking performance (Sarkar and Rakshit [42]). Pasiouras and Kosmidou [29], Flamini et al [11], Ćurak et al [23], Seeniah et.al [43], Hossain & Khalid [44], consider only ROA while Anbar&Alper[45], Petria et al[14],Albulescu[32], Abel & Le Roux[46],Ebenezer et al[47], Almaqtari et al[19], consider both ROA and ROE as the measure of performance in their studies. ROA, ROE and NIM have been used as the measure of banks 'performance in the works of Dietrich & Wanzenried[13], Ongore & Kusa[12], Al-Homaidi et al [21], Kassem and Sakr [48], and in Sarkar &Rakshit [7].

The trend of existing works thus indicates that there are almost no studies which consider the impact of unemployment on the performance of commercial banks. This study aims to bridge this gap in the existing research.

2.1. Research Gaps.

A journey into the world of existing literature clearly reveals the fact that, there are very few studies (Horobet et.al [6], Sarkar and Rakshit [7,8]) which consider unemployment as an external performance driver of commercial banks. Though there are some studies regarding the impact of unemployment on non-performing assets of banks (Louzis et.al [37], Messai and Jouini [38]), there are almost no studies which consider the impact of unemployment on the performance of the banking sector. This work attempts to bridge this gap in the existing studies and strives to analyse the impact of unemployment in affecting the performance of the commercial banks in India. Taking unemployment as the focused independent variable and some bank-specific and macro-economic factors as the control variables, this study also desires to inspect whether the impact of unemployment on banking performance changes due to sequential inclusion of these control variables. A study on banking performance which considers unemployment as the primary independent variable seems to be novel in the world of existing studies and might add some valuable contribution in the world of knowledge.

3. Objectives of the Study.

This study attempts to examine whether unemployment has any impact in banking performance of India. Along with this broad objective, this study also attempts to answer the following questions:

a) How do operating efficiency, asset quality and quality of loan, as control variables, affect banking performance?

b) Is there any change on the impact of unemployment on performance when bank-specific control variables are added with the primary independent variable?

c) Whether macroeconomic control variables like GDP, Inflation and cash with the people affect banking performance of India?

d) Is there any change on the impact of unemployment on performance when macroeconomic control variables are considered along with the primary independent variable?

e) Which bank-specific and macro-economic control variables have contributory influence on the performance of Indian commercial banks?

Taking return on equity (ROE) and net interest margin (NIM) as the performance indicators, unemployment (UMP) as the focused independent variables, asset quality (ATQ), operating efficiency (OEF), quality of loan (QOL), as the internal control variables and GDP, Inflation (IFL), cash with the people (CWP) as the external control variables, this study makes an attempt to answer these questions.

4. Data and Methodology.

4.1. Description of Variables.

This work desires to investigate whether unemployment leaves any impact on the profitability of Indian commercial banks. Profitability measures are taken as the dependent variable, unemployment as the primary independent variable, and some bank-specific and macroeconomic factors are considered as the control variables for this study. A brief description of these variables is presented in the following section. Table I depicts the measure of the variables and the acronym used in this analysis.

4.1.1. Dependent Variables.

Existing literature on banking performance use Return on assets (ROA), Return on equity (ROE), and Net interest margin (NIM) as the measure of performance(profitability) of commercial banks (Sarkar and Rakshit [8]). Return on assets (ROA), measured as net profit to total assets ratio, shows how assets are being managed by commercial banks to generate profit (Dietrich and Wanzenried [13], and is regarded as a crucial indicator of commercial banks profitability (Sarkar and Rakshit [7,42], Athanasoglou et al [10]). Return on equity (ROE), expressed as net profit to the sum total of capital, reserves and surplus, shows the return the shareholders may receive from their equity holding (Sarkar and Rakshit [9]). ROE reflects the effectiveness with which a bank manages its equity capital (Robin et.al [26]). Net interest margin, may be expressed as the ratio of net interest income to total assets (Sarkar and Rakshit [8]). Thus, the profit a bank may earn from interest earning activities is reflected through NIM (Dietrich and Wanzenried [13]).

In tune with the existing studies and following Sarkar and Rakshit [8], we have considered ROE and NIM as the measure of commercial banks performance.

4.1.2. Independent Variables.

This study tries to consider the impact of unemployment on the performance of commercial banks. In doing so several bank-specific and macro-economic control variables have been chosen along with unemployment, the focused independent variable of this study. Details of the independent and control variables taken for this analysis has been presented below.

4.1.2a. Focused independent Variable.

Unemployment rate (UMP): Unemployment rate is a vital factor to characterise the overall economic situation of a country and may have some important bearings on the performance of commercial banks' (Sarkar and Rakshit [7]). It deprives the people of their entitlement (Sen [1]) and leads to a reduction in their income and purchasing capacity. Unemployment may adversely affect occupational skill of the people, may lead to social isolation of the unemployed and thus may have some adverse consequences on social welfare (Paul [3], Perović [4]). The mental peace and tranquility of the employed may also get disturbed due to the prevalence of unemployment (Lee et al [2]). Unemployment leads to an increase in bad loans (Messai and Jouini [38], Škarica [49] Ghosh [50]) and may adversely impacts the profitability of banks. Number of unemployed people as a percentage of labour force can be taken as the measure of unemployment (Sarkar and Rakshit [8]) and we have used this measure in this analysis.

4.1.2b. Bank-Specific Control Variables.

Asset Quality (ATQ): Advance to asset ratio may be considered as a proxy for asset quality (Anbar &Alper [45], Robin et. al [26], Almaqtari et al [19], Sarkar &Rakshit [7]). The amount of assets utilized for interest earning drive is thought to reflect the asset quality of commercial banks. Lower the ratio of assets lying idle higher might be the profitability of the banks provided these advances do not turn into non-performing nature. Since unemployment may have some impact on demand for advances and non-performing loan as well, we have taken asset quality (ATQ) as a control variable into our analysis.

Operating Efficiency (OEF): Operating efficiency may be expressed as the ratio of operating expenses to net interest income (Rasheed and Jabeen [20]) and this measure have been used as a proxy for operating efficiency in this study. Some of the existing studies (Pasiouras and Kosmidou [29], Dietrich and Wanzenried [22]) consider the ratio of operating expenses to income as one of the performance determinants of commercial banks and presume that this ratio may affects profitability in a negative manner. Unemployment rate may have

some impact on the operating efficiency of banks (Sarkar and Rakshit [8]). That is why, operating efficiency has been considered as an internal control variable in this analysis.

Quality of Loan (QOL): Net non-performing assets to loan ratio has been used as an indicator of credit quality in Sarkar and Rakshit [9] Barua et.al [25], while in Dietrich and Wanzenried [13], this has been approximated as the percentage of loan loss provisions to total loans. An increase in the amount of non-performing loans may create some adverse impact on the performance of commercial banks (Petria et.al [14], Ghosh [50]) and for this reason commercial banks always attempt to maintain credit quality by reducing the burden of stressed assets (Pramahender [51]). Since unemployment may have some implications on non-performing loans (Messai and Jouini [38], Škarica [49], Ghosh [50], Sarkar and Rakshit [7,8]) we have taken net non-performing assets (Net NPA) to net advances as an indicator of the loan quality (Sarkar et al [52]) and as a control variable for this study.

4.1.2c. Macro-economic Control Variables.

GDP: The market value of final goods and services produced within the geographical boundary of a country in a given period is called gross domestic product (GDP). The growth rate of an economy is taken to be synonymous with the growth rate of GDP. Expansion of GDP is presumed to affect the economic well-being of the people and thus GDP growth may have some impact on the performance of commercial banks (Athanasoglou et al [10]). It is believed that banking profitability is procyclical because lending activities and consequently interest income may be affected by cyclical movements (Flamini et.al [11], Dietrich & Wanzenried [13]). It is generally believed that there exists a positive association between economic growth and performance of commercial banks (Demigruch-Kunt & Huizinga [27], Saona [53]), though there are evidences where GDP growth have negative influences on banking performance. Since GDP growth have important connections with the level of employment, real GDP growth rate (GDP) has been taken as the macroeconomic control variable for this study.

Inflation (IFL): Inflation refers to a rise or a tendency towards a persistent rise in the general price level (Sarkar and Rakshit [8]). Inflation may impact banking performance because it has impact on both the cost and revenue of banks (Kosmidou [54]). The influence of inflation on banking profitability relies on whether it is projected fully or not (Perry [55], Sarkar and Rakshit [7,8]). Banks may grab the benefits of inflation through judicious adjustment of interest rate (Ćurak et al [23]) if it can be predicted beforehand. Thus, there might be a positive association between inflation and the profitability (Molyneux and Thornton [56]). However, inflation, if not predicted, may create some adverse impact on commercial banks performance (Dietrich & Wanzenried [13]). Thus, inflation may have some mixed impact on banking profitability. Inflation has some association with unemployment as suggested in the Phillips curve (Phillips [57]). Attempt to reduce inflation may cause unemployment to rise (DiTella et.al [58]). Because of the close interconnection between inflation and unemployment, the former has been considered as the macro-economic control variable for this study

Cash with the people (CWP): Cash with the people consists of currency in circulation net of currency held by the bank. According to Keynes, people demand cash either to perform transaction or to meet precautionary requirements or to generate profit on the basis of their knowledge on market conditions (Froyen [59]). Cash holding by the people depends on a host of factors including income of the country, opportunity cost of holding cash, availability of alternative modes of payment, size of the underground economy etc (Nachane et.al [60]). The way people use this currency have implications for the velocity of circulation and consequently for the supply of money, and also for activity and income. Thus, currency with the public may have important impact on the banking sector and also for the economy as a whole (Kumar [61]). Cash holding by the people signals a country's advancement towards cash less economy. Thus, currency with the people, might have some

bearings on the performance of commercial banks due to its role in affecting money supply and aggregate income. Since unemployment may have important impact in a person's income and currency holding as well, we have considered cash with the people (CWP) as a macroeconomic control variable for this study. In our study currency with the public as a percentage of broad money has been taken as the proxy for cash with the people.

4.2. Data.

This study attempts to find out the impact of unemployment on the performance of commercial banks in India over the period from 2001 to 2017. All Public and private sector commercial banks (41 in total) which were continuously in operation during this period have been selected for this study. The data on measures of performance (Return on equity and Net interest margin), bank-specific control variables (Asset Quality, Operating efficiency and Quality of loan) and some macro-economic control variables (inflation and Cash with the people) have been taken from Reserve Bank of India (RBI) database. Data on gross domestic product (GDP) has been taken from national statistical office of the Government of India and unemployment data has been taken from world bank data base. Since, data on all dependent and independent variables are available for the entire period, we have a balanced panel data set of 41commercial banks over the 17-year period starting from the year 2001. Our analysis begins from the year 2001 because by this period most of the important reform measures for the commercial banks in India were undertaken. The year 2017 has been taken as the final year of the study period because from April 2017 onwards numerous changes have started taking place in the Indian banking sector by means of merger of different government banks. These mergers have changed the situation of various public sector banks with regard to size, market share, non-performing assets etc. Extension of study period after 2017 without considering these merged public sector banks is useless and inclusion of data of these merged banks may provide unrealistic results. For all these considerations a 17-year period beginning from 2001(2001-2017) has been considered as the period of study for our analysis.

The measure of the variables and the acronym used in this analysis has been presented in Table I. From the table it is seen that return on equity (ROE) and net interest margin (NIM) have been taken as a proxy for commercial banks performance and as the explained variables for this study. Unemployment rate has been considered as the focused independent variable, asset quality, operating efficiency, quality of loan, as the bank-specific control variables and GDP, inflation, cash with the people have been taken as the macro-economic control variables for this study. Table II depicts the basic relationship of the variable in terms of descriptive statistics. It shows the maximum and the minimum values, mean, and standard deviation of all variables and VIF values of the independent variables. The VIF (Variance-inflating factor) values of each are less than 5 with a mean VIF of 1.84(not reported in the table) clearly indicates that there is no multicollinearity among the independent variables (Kleinbaum et.al [62]).

Table III reports the unit root test of the variables, as developed by Levin et al [63], and Im et al [64]. Levin-Lin-Chu test allows the time trends, the residual variances and higher order autocorrelation to vary across individual units without limitation while Im-Pesaran-Shin test is based on estimating average of individual unit root test statistics by permitting simultaneous stationary and non-stationary series, and it allows heterogenous panels with serially uncorrelated errors (Das [65], Sarkar and Rakshit [9]). Thus, if unit root tests are calculated on the basis of these two tests, we may get a true picture regarding stationarity of the data (Sarkar and Rakshit [7]) and this has been shown in table III. It is clear from the table that among the explained variables, return on equity (ROE) is not stationary at level but at first difference as per both Levin-Lin-Chu test and Im-Pesaran-Shin test while net interest margin (NIM) is stationary at both levels and first difference as per Levin-Lin-Chu test but stationary at first difference only according to Im-Pesaran-Shin test. Unemployment, the primary independent variable for this study is stationary at both levels and first difference according to Levin-Lin-Chu

test but stationary at first difference only as per Im-Pesaran-Shin test. Among the bank-specific control variables asset Quality (ATQ) and operating efficiency (OEF) is stationary at level and first difference as per both the tests while quality of Loan (QOL) is stationary at both levels and first difference as per Levin-Lin-Chu test but stationary at first difference only according to Im-Pesaran-Shin test. Among the macroeconomic control variables gross domestic product (GDP) is stationary at level and first difference as per both the tests where as inflation (IFL) and cash with the people (CWP) is stationary at first difference only according to both Levin-Lin-Chu test and Im-Pesaran-Shin test. The results of the unit root tests as depicted in table III thus indicates that explanatory and explained variables taken for this study are either stationary at level or at first difference or at both levels and first difference according to the test procedures considered for this study.

Table I: Description of Variables

Variables	Measurement	Acronym
Dependent Variables		
Return on Equity	Net profit/ Capital+ Reserves and Surplus	ROE
Net interest Margin	Net interest income/Total assets	NIM
Independent Variable		
Unemployment	No of unemployed persons as a percentage of labour force	UMP
Control Variables		
Bank-Specific Control Variables		
Asset Quality	Advance/Asset	ATQ
Operating Efficiency	Operating expenses/Net interest Income	OEF
Quality of Loan	Net NPA/Net advance	QOL
Macro-Economic Control Variables		
GDP	Real GDP growth rate	GDP
Inflation	Average rate of Inflation in India (CPI)	IFL
Cash with the People	Percentage of the total money supply held by the public as currency	CWP

Source: *ROE, NIM, ATQ, OEF, QOL, IFL, CWP: Reserve Bank of India Website(**www.rbi.org.in** accessed on 14th September 2020),GDP: National Statistical office, Government of India(**www.mopsi.gov.in** accessed on 26th May,2020), UMP: World Bank Database, (**www.data.worldbank.org** accessed 31st May,2020).*

Table II: Descriptive Statistics

Dependent Variables	**Observations**	**Maximum**	**Minimum**	**Mean**	**SD**	
ROE	697	63.79	-42.96	13.29	11.62	
NIM	697	4.69	00.66	02..78	00..62	
Independent and control Variables	Observations	Maximum	Minimum	Mean	SD	VIF
UMP	697	05.73	05.28	05.57	00.13	1.46
ATQ	697	70.61	26.72	55.74	08.74	2.70
OEF	697	236.89	40.26	75.37	21.62	1.26
QOL	697	18.37	00.07	02.85	02.94	1.97
GDP	697	08.50	03.10	06.59	01.77	1.56
IFL	697	12.11	02.49	06.60	02.85	1.97
CWP	697	16.47	11.37	14.47	01.32	1.95

Source: *ROE, NIM, ATQ, OEF, QOL, IFL, CWP: Reserve Bank of India Website. GDP: National Statistical office Government of India, UMP from World Bank Database. Note: Calculation of ATQ, OEF, QOL, CWP has been done taking data of Advance, Assets, Operating expenses, net interest income, net Non-performing Assets (Net NPA), Net advance, currency with the public from Reserve Bank of India website(**www.rbi.org.in** accessed on 14th September,2020)GDP: National Statistical office Government of India(**www.mopsi.gov.in**, accessed on 26th May,2020) UMP from World Bank Database(**www.data.worldbank.org** accessed on 31st May,2020) Here ROE=Return on Equity, NIM=net interest margin, UMP: Unemployment, ATQ= Asset Quality, OEF=Operating efficiency, QOL= Quality of Loan, GDP= Gross Domestic Product, IFL= Inflation rate, CWP= Cash with the People*

Table III: Results of Panel Unit Root Tests

Variables	***LLC (Levin-Lin-Chu) Test (Adjusted t statistic value)***		***IPS(Im-Pesaran-Shin) Test (z-t-tilde-bar statistic value)***	
	Level	***1st difference***	***Level***	***1st difference***
ROE	02.98	-07.39***	02.42	-10.28***
NIM	-04.54***	-09.45***	-00.69	-11.17***
UMP	-13.06***	-09.79***	00.12	-06.40***
ATQ	-08.41***	-04.11***	-01.95**	-07.97***
OEF	-05.33***	-10.40***	04.43***	-10.69***
QOL	-11.18***	-06.68***	02.14	-03.10***
GDP	-11.76***	-22.17***	-09.89***	-14.34***
IFL	03.89	-07.45***	02.21	-09.49***
CWP	02.90	-06.42***	07.27	-08.67***

Source: *ROE, NIM, ATQ, OEF, QOL, IFL, CWP: Reserve Bank of India Website(**www.rbi.org.in** accessed on 14th September,2020),GDP: National Statistical office, Government of India(**www.mopsi.gov.in** accessed on 26th May,2020) UMP: World Bank Database, (**www.data.worldbank.org** accessed on 31st May,2020) Note: Unit root tests has been calculated using STATA. Adjusted t* statistic has been given in case of Levin-Lin Chu (LLC) test and z-t-tilde-bar statistic has been given in case of Im-Pesaran-Shin (IPS) test. *, ** and *** denote 10%, 5% and 1% level of significance respectively. Here ROE=Return on Equity, NIM=net interest margin, UMP: Unemployment, ATQ=Asset Quality, OEF=Operating Efficiency, QOL= Quality of Loan, GDP= Gross Domestic Product, IFL= Inflation rate, CWP= Cash with the People*

4.3. Methodology.

A system GMM estimation technique developed by Arellano and Bover [66] has been used in this study. The justification for the choice of system GMM methodology has been described in the following section.

4.3.1. Why System GMM?

Generally, panel regression analysis is used in the works pertaining to banking sector performance. Two main challenges which requires to be addressed in such type of works are the issues of endogeneity and the problem of profit persistence (Sarkar and Rakshit [7]). To address these issues a dynamic panel estimation (GMM estimation) framework has been used in the works of Athansoglou et al [10], Dietrich and Wanzenried[13], Le &Ngo[34], Sarkar and Rakshit[9,42]. According to Roodman [67], GMM estimation may be used in the situations where there is a dynamic relationship i.e., the present values of the dependent variables are influenced by previous values, some of the independent variables are endogenous and number of cross section units are greater than the number of time series observations. This study conforms to almost all these preconditions suggested by Roodman [67] because of the following reasons. Firstly, banking profitability in one period may be affected by the profits of the earlier periods because it is possible for a profitable bank to increase equity by retaining profit (Garcia-Herrero et.al [68]). It is also highly plausible for a profitable bank to influence its future profit by means of business expansion through higher advertisement expenditure etc (Sarkar and Rakshit [9]). Thus, banking profit in one period may be affected by past profit and may also influence future profits. This indicates that there is a dynamic relationship as the present values of the dependent variables are influenced by past values. Secondly, there are ample reasons to believe that some of the independent variables may be endogenous. A profitable bank can also influence its size, and operating efficiency (Dietrich and Wanzenried[13]) and may also have some impact on non-performing loans (Sarkar and Rakshit[9]). Thirdly, in this study the number cross section units (41) are greater than the number of time series observations (17). Thus, the present study follows all the conditions for applying GMM estimation technique as suggested by Roodman [67]. Moreover, Delis and Kouretas [69], suggest that GMM estimation has two additional advantages. Firstly, GMM offers efficient estimation even in the presence of unit roots and secondly, it accommodates the problem of endogeneity in an efficient manner. Besides, GMM estimation may be efficiently used in the situations where some variables are stationary at levels and some are stationary at first difference (Sarkar and Rakshit [9]). Table III shows that some of the variables are stationary at levels and some are stationary at first difference. Thus, there are sufficient reasons for the use of GMM estimation procedure for this study and that is why so we have applied a system GMM estimation technique developed by Arellano and Bover (Arellano and Bover [66]).

4.3.2. System GMM Model.

A system GMM model has been used for this study. According to Ullah [70] GMM estimator provides a more efficient estimates for the coefficients involved in the model when there is a balanced panel. Besides, system GMM estimator controls for unobserved heterogeneity and profit persistence (Dietrich and Wanzenried[13]). According to Roodman [67] both one step and two step variants are used in the system GMM model. However, a two-step variant is asymptotically efficient than one step- variant (Roodman [67]). That is why, a two-step system GMM model has been applied in this study.

Following the works of Athansoglou et al [10], Dietrich and Wanzenried[13], Sarkar and Rakshit[9], we can apply a system GMM model as shown by the equation 1.

$$Pf_{it} = \theta + \rho Pf_{i,t-1} + \beta_1 UMP_{it} + \sum_{k=2}^{K} \beta_k \, BK_{it}{}^{k} + \sum_{r=2}^{R} \beta_r \, MR_{it}{}^{r} + \varepsilon_{it} \quad (1)$$

Pf_{it} is the profitability(performance) of bank i at time t (ROE and NIM), where $i = 1, 2, .., N, t = 1, \dots\dots, T$. θ denotes the constant term, UMP_{it} denotes unemployment, the focused independent variable, BK_{it} is the bank specific and MR_{it} is the macroeconomic control variables, ε_{it} is the disturbance term. The value of $\rho(0< \rho <1)$ signifies profit persistence, which ultimately returns to their normal level. A value of ρ near to zero implies a competitive structure of the banking industry where as a value nearing to 1 implies that the industry is not much competitive (Dietrich & Wanzenried [13]).

Given the structure of our work we first estimate the impact of primary independent variable UMP separately for ROE and NIM using two step system GMM estimators in model 1. Bank-specific and macroeconomic control variables along with the UMP are included in model 2 and 3 to notice possible change in impact due to the inclusion of these control variables. Finally, we include all independent and control variables in model 4 to examine the effect of all these variables on performance measured by ROE and NIM. Appropriate post estimation tests have been conducted to examine the statistical validity of the findings.

5. Estimation Results.

Estimation results of two step GMM model has been presented in tables IV and V. Model 1 in each table depicts the impact of focused independent variable UMP on the banking performance measured in terms of ROE and NIM. Model 2 of the tables show the results when bank-specific control variables (Asset Quality, Operating efficiency and Quality of loan) are included with UMP. Model 3 of the tables IV and V depicts the impact of unemployment and some other macro-economic control variables like gross domestic product (GDP), inflation (IFL) and cash with the people (CWP) on the performance measures ROE (Return on Equity) and NIM (Net Interest Margin). Finally Model 4 of the tables presents how banking performance is affected when all independent and control variables are taken together. Model 2,3, and 4 of the tables also give in indication whether the impact of the focused independent variable changes due to sequential inclusion of bank-specific control variables (Model2), macroeconomic control variables (Model3) and all variables (Model4).

Estimation results as depicted in tables IV and V suggest that lagged dependent variables (ROE and NIM) are significant at one percent level in all the models 1-4 in both the tables. The highly significant coefficient values of the lagged dependent variables validate the use of a dynamic model. In all models of the tables IV and V, it is seen that the coefficient of the profitability measures is positive. This signifies that there is profit persistence in the Indian banking industry. In model 4 of the tables IV and V it is seen that coefficient of the profitability measures ROE and NIM are relatively small. This implies there is some competition in the Indian banking industry (Dietrich and Wanzenried[13], Sarkar and Rakshit[9,42].

It is further evident from the tables IV and V that the results of all models 1 to 4 satisfies relevant post estimation tests. Wald test probability values ensure the goodness of fit of the estimated model. Result tables IV and V suggest that Arellano-Bond 2nd order auto correlation is far higher than 0.10 in all models 1,2, 3 and 4. This implies that there is no serial correlation in the estimated models. For all models of the result tables, it is seen that probability value of the Sargan test statistic is greater than 0.10 which implies that there are no over-identifying restrictions in the model. These post estimation tests confirm that the results are statistically valid and provide an efficient estimate of the parameters.

Model 1 of the tables IV and V show that the principal independent variable has highly significant positive association with ROE and NIM. The model 2 and 3 of the tables indicate that the significant positive association between unemployment and profitability measures (ROE and NIM) remain unaltered with the sequential inclusion of bank-specific and macroeconomic control variables. Model 4 of the tables IV and V depict that when all variables (focused independent variable and bank-specific and macroeconomic control

variables) are taken into consideration the result does not change. Thus, from the result tables it can be concluded that unemployment has a significant positive association with the banking performance in India.

The significant positive association between unemployment and the profitability measures seem to be in contradiction with the general belief. It is presumed that since unemployment deprives the people of their economic opportunities (Sen [1]), it may have some negative impact on income and purchasing power of the people leading to lower level of aggregate demand and income. Thus, it is presumed that unemployment might have some negative impact on banking profitability. However, the estimation results arrived in this study shows a result which is strictly in opposition to the general belief. The positive association between unemployment and banking profitability in India may be explained as follows. Banks in India are not very keen to provide loans to the unemployed. Thus, unemployment may not impact their lending business. But Indian banks take the advantage of unemployment by employing staff at reduced wage and thereby keep their operating expenses at a lower level (Sarkar and Rakshit [8]). Facts suggest that not only private sector banks, public sector banks also employ workers in the subordinate cadre on daily wage basis and pay remuneration much less than the rate suggested by the Indian Banks' Association (IBA). Outsourcing of services also practiced by most of the public and private sector banks (Sarkar and Rakshit [8]). As a result, Indian banks may mange to keep their operating expenses at a lower level. The reduced operating expenses in salary negotiation (Horobet et.al [6]) may be a reason for positive association between unemployment and banking performance in India. This positive association between unemployment and banking performance get support from Naruševičius[71], who observed a positive association between unemployment and profitability of banks in Lithuania.

Table IV depicts that asset quality has a significant negative association with ROE in model 2 and in model 4. It is also evident from table V that ATQ has significant negative association with NIM in model 2 but in model 4 the association is negative but not significant. The significant negative association between ATQ and profitability measures suggest that increase in advance to asset ratio may lead to an increase in impaired loans and lead to a diminution of the profits of the commercial banks. Negative association between ATQ and profitability finds support from the works of Anbar and Alper [45].

It is clear from the tables IV and V that operating efficiency (OEF), as expected, leaves significant negative impact on profitability measures ROE and NIM. It is further evident from the tables that the significant negative association between OEF and ROE, NIM as is found in model 2 of the tables IV and V remains unaltered in model 4 where all variables (focused independent variable, bank-specific control variables and macroeconomic control variables) are taken into consideration. The result signifies the fact that, banks must be vigilant about increase in operating expenses if they desire to stay on the profitability track (Athanasoglou et.al [10], Dietrich and Wanzenried[22]). This significant negative association between operating efficiency and profitability is in tune with the works of Rashid and Jabeen [20], who find that increased operating costs leads to lower profitability for banks in Pakistan.

It is always a challenge for commercial banks to minimise the burden of impaired loans. Increasing volume of stressed asset poses significant concern before the health and soundness of the banking sector (Sarkar and Rakshit [9]). That is why commercial banks always attempt to minimise the burden of non-performing asset. Increased volume of non-performing loans deteriorates credit quality and exerts negative impact on commercial banks performance. Model 2 and 4 of the result table IV and model 4 of table V indicate that an increase in the burden of stressed asset significantly reduces ROE and NIM of commercial banks. It is further evident from the table IV that the result obtained in model 2 remains unaltered in model 4 where all variables are taken into consideration. The significant negative association between quality of loan (QOL) and profitability measures signify that commercial banks should be cautious about the burden of non-performing loans and should not vie for expansion of credit in an indiscriminate manner. The same result is observed in

Barua et.al [25], who found that the ratio of net nonperforming loans to advance exerts significant negative impact on profitability.

GDP refers to the sum of all goods and services produced in an economy within a particular period of time and it is presumed that increase in national income may have some positive impact on the performance of the commercial banks (Demigruch-Kunt and Huizinga [27], Bikker and Hu [72], Kosmidou et.al [28], Laryea et.al [73], Ebenezer et al [47], Bouzgarrou et.al [74]). GDP growth may control cyclical fluctuations (Flamini. et al [11]) and is assumed to influence factors affecting the demand for loans and volume of deposits (Sarkar and Rakshit [7,8]). GDP growth may also exert negative impact on the performance of commercial banks as is found in Ongore and Kusa [12], Rasheed and Jabeen [20], Al-Homaidiet.al [21] Robin et.al [26]. The results as found in tables IV and V echoes with these mixed findings. Model 2 and 4 of table IV indicates that GDP lays highly significant negative association on ROE. However, in case of NIM the association is positive and vastly significant. The significant positive association between GDP and NIM may be due to an increase in the demand for loans (Tan [24], Yao et.al [75]) which may lead to an increase in interest earnings (Dietrich and Wanzenried[13]) and so also NIM of commercial banks.

Inflation may be beneficial provided commercial banks can predict about future inflation (Perry [55], Curak et.al [23]). From the estimation results it is seen that inflation has highly significant positive association with ROE when only bank-specific control variables are considered. But when we consider all variables, inflation is seen to have greatly significant negative association with ROE. However, models 2 and 4 of table V shows that there is a vastly significant negative association between inflation and NIM. This negative association suggests that banks in India might not be able to predict inflation fully during the reference period. This result is in tune with the works of Ongore and Kusa [12], Lee et.al [76], Abel and Le-Roux [46], Gupta and Mahakud [77], Sarkar and Rakshit [7] who find a negative association between inflation and profitability of the commercial banks of the respective countries.

Our result hints that cash with the people (CWP) exerts significant positive association with ROE when only bank-specific control variables are considered, however it affects ROE in a significantly negative manner when all variables are taken into consideration. But model 2 and 4 of table V pictures that CWP has significant positive association with NIM both in case of internal control variables and all variables taken together. The significant positive association between CWP and ROE in model 2 and between CWP and NIM in model 2 and 4 indicates that the cash held by the people has been utilized more for transaction purposes. In a country like India majority of the transactions in the unorganized sectors are performed in cash. Moreover, the problem of illiteracy, lack of financial literacy (Kumar [61]), unavailability of alternative modes of transaction to the common people (Nachane et.al [60]), necessitates the use of cash in carrying out transactions and generating income. Thus, an increasing amount of cash with the public is translated in creating more output and income and may lead to an enhancement of profitability of banks.

Table IV: System GMM Estimation for Dependent Variable (ROE)

Variables	Model 1	Model 2	Model 3	Model 4
$ROE_{i,t-1}$	0.758***	0.381***	0.663***	0.385***
	(0.012)	(0.020)	(0.012)	(0.013)
UMP	4.162***	5.238***	1.796**	3.447***
	(0.717)	(0.990)	(0.834)	(0.524)
ATQ		-0.543***		-0.560***
		(0.026)		(0.033)
OEF		-0.181***		-0.179***
		(0.008)		(0.009)
QOL		-1.727***		-1.998***
		(0.109)		(0.119)
GDP			-0.446***	-0.788***
			(0.051)	(0.066)
IFL			0.087**	-0.159**
			(0.042)	(0.070)
CWP			1.123***	-0.305**
			(0.126)	(0.139)
Observations	656	656	656	656
Arellano-Bond Test for $AR(2)$	0.743	0.438	0.739	0.574
Sargan Test p-value	0.132	0.152	0.121	0.126
Wald test p- value	0.000	0.000	0.000	0.000

Source: *Authors' calculation. Standard errors are in brackets. Note: *, ** and *** denote level of significance at 10%, 5% and 1% level respectively. N.B. Two Step Estimation.*

Table V: System GMM Estimation for Dependent Variable (NIM)

Variables	Model 1	Model 2	Model 3	Model 4
$NIM_{i,t-1}$	0.817***	0.598***	0.565***	0.410***
	(0.066)	(0.078)	(0.069)	(0.084)
UMP	0.653***	0.408***	0.810***	0.776***
	(0.158)	(0.130)	(0.187)	(0.148)
ATQ		-0.016***		-0.006
		(0.005)		(0.005)
OEF		-0.013***		-0.014***
		(0.002)		(0.002)
QOL		-0.012		-0.034***
		(0.010)		(0.012)
GDP			0.045***	0.029***
			(0.008)	(0.006)
IFL			-0.009*	-0.043***
			(0.005)	(0.008)
CWP			0.079***	0.060**
			(0.022)	(0.024)
Observations	656	656	656	656
Arellano-Bond Test for $AR(2)$	0.288	0.743	0.717	0.311
Sargan Test p-value	0.186	0.199	0.182	0.189
Wald test p- value	0.000	0.000	0.000	0.000

Source: *Authors' calculation. Standard errors are in brackets. Note: *, ** and *** denote level of significance at 10%, 5% and 1% level respectively. N.B. Two Step Estimation.*

6. Conclusions.

This study desires to examine whether unemployment has any impact on the performance of Indian banking sector. The results show that unemployment has significant positive impact on the performance measures ROE and NIM. Model 2 ,3 of the results table IV and V show that the impact of unemployment on banking performance remains unchanged due to the sequential inclusion of the bank-specific and macroeconomic control variables. Model 4 of the results table indicates that when focused independent variable, and other control variables are taken into consideration the result remains unchanged. Thus, our study result indicates that unemployment has important contributory influences on the banking performance of India.

The bank-specific control variables like asset quality, operating efficiency and quality of loan exert significant negative influence on ROE and NIM and these findings remain almost unaltered in model 4 where all variables are considered. Among the macroeconomic control variables, gross domestic product affects ROE in a significant negative manner as is evident from model 2 and 4 of the table IV, however table V pictures the fact that it has significant positive association with NIM. There is highly significant positive association between inflation and ROE when focused independent variable accompanies bank-specific control variables but when all variables are taken together, inflation is seen to exert significant negative influence on ROE. But table V shows that inflation and NIM are significantly related and this association is negative. Cash with the people affects ROE and NIM in a significant positive manner as is evident from model 2 of table IV and model 2 and 4 of table V. However, when all variables are taken together CWP is seen to have highly significant negative impact on ROE.

The estimation results obtained in this analysis provide an answer to the objectives set in section 3. It is seen that unemployment has significant contributory influence on the banking performance ROE and NIM and this result remains unaltered with the sequential inclusion of bank-specific and macroeconomic control variables. Even when we consider all the variables together, we get the same findings as observed in model 1 i.e. when we have taken focused independent variable only. The findings of the study also show that bank-specific and macroeconomic control variables have significant influences on the performance of Indian commercial banks. Thus, our results meet all the research objectives of this study.

The main focus of this study is to examine whether unemployment affects performance of the Indian commercial banks. The estimation results indicate that unemployment has significant positive influence both on return on equity and net interest margin. The most plausible explanation for this phenomenon may be that unemployment affects banking business little but opens opportunities before them to reduce their operating expenses by employing staffs at lower wage, employing casual staff, taking recourse of outsourcing etc (Sarkar and Rakshit [8]). In simple terms banking sector of India grab the benefit of weak bargaining power of a huge number of available work force who have little say in fixing remuneration during the time of entry into the job market.

There is no denying the fact that banking sector in India specifically the public sector banks are facing keen competition in the aftermath of banking sector reforms (Prasad and Ghosh [78], Bhaduri and Shanmugam [79]). The intensification of competition in the banking industry has led to the introduction of new technology, new products as well as new business practices (Mohan [80]). Amidst this competitive atmosphere banks will obviously vie for higher and higher profit by cutting expenses and lowering the burden of stressed assets. However, commercial banks should also be concerned about the vision of inclusive growth as set by the Indian policy makers. A country can't prosper much leaving a huge lot of people in the active labour force idle. Though creation of employment opportunities has always been a major focus of Indian development agenda (Padhi and Motkuri[81], Papola and Sahu[82]), jobless growth ,increasing informalisation and casualisation of job

opportunities(Mehrotra et.al[83]) characterises the growth experience of India. In recent times specifically after Covid-19 crises, informalization of even the formal sector is on the rise (Padhi and Triveni [84]). Amidst this situation Indian banks should not forget their responsibility and should devise appropriate strategies to finance for creating employment opportunities. There is no doubt that public sector banks in India shoulder important responsibilities to meet the development priorities of the Indian economy (Sarkar and Rakshit [8]) but private sector banks should also come forward to lessen the curse of unemployment in the Indian economy. Reserve Bank of India should devise appropriate policies in this direction so that banking sector in India play some effective role in reducing the burden of unemployment to meet the objectives of inclusive development.

Authors' Contribution.

Sreemanta Sarkar[1]: Conceptualisation, Data Collection, Selection of Methodology, Calculation, Preparation of initial draft.

Debdas Rakshit[2]: Review, editing and refinement of initial draft.

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Conflicts of Interest

The authors do not have any conflicts of interest

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