The impact of foreign direct investment inflows on nonperforming loans: the case of UAE

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Abstract

Banking sector is at a risk of worsening loan quality which is a major threat to the stability of financial system. The impact of foreign direct investment (FDI) inflows on nonperforming loans (NPLs) in United Arab Emirates (UAE) is empirically investigated in this study. The data from 2008 to 2017 is collected and analysed through ordinary least square (OLS) technique. The findings reveal that FDI inflows reduced the size of NPLs during the economic crisis. Also, the combined effect of higher FDI inflows and bank efficiency reduced the size of NPLs for banks while the combined effect of FDI inflows and better institutions, such as strong regulatory quality, did not reduce the size of NPLs but rather increased the size of NPLs. The findings have implications. The findings contribute to the literature to establish a link between FDI inflows and NPLs by examining the link between FDI inflows and NPLs in the context of banks in the UAE.

Keywords: *Foreign direct investment; nonperforming loans; United Arab Emirates; bank profitability; asset quality*

JEL Code: C23, E44, G21, G10,

1. Introduction

Loans are the major assets of banks. Bank loans face credit risk in the external economic environment when banks lend money to borrowers, and such lending may give rise to nonperforming loans (NPLs) when borrowers default, which can negatively affect bank performance (Ozili and Outa, 2017; Louzis et al., 2012). Therefore, controlling the size of NPLs is signatory for optimal bank performance. The literature has identified a handful determinants of NPLs which are classified as bank-specific determinants and macroeconomic determinants (Berger and DeYoung, 2001; Nkusu, 2011; Makri et al, 2014; Anastasiou et al, 2016, Ozili, 2019b). Past studies identified different factors that may affect NPLs other than the traditional bank-specific and macroeconomic factors such as institutional factors, external trade deficits, the levels of financial development. (Tanasković and Jandrić, 2015, Fang et al, 2011; Ozili, 2019a; and Kauko, 2012). The main contribution of this study is to the literature focusing on the effect of foreign direct investment (FDI) inflows on the level of non-performing loans (NPLs) in banks – to determine whether FDI inflows contribute to the persistence of NPLs in banks – which is untapped and not fully explored in the literature.

FDI equally contributes in both developed and developing countries to the economic development strategies (Jensen, 2003). Hence, FDI inflows are considered a vital component of capital inflows for developing countries as these drives technological progress facilitated by improved production techniques (Peres et al., 2018; UNCTAD, 2004).

The political and economic stability of UAE has consistently attracted new FDI from less stable countries. FDI inflows in UAE increased by USD31 million between 2017 and 2018 and are estimated at USD10.3 billion in value (UNCTAD World Investment Report, 2019). The World bank ranked the UAE as one of the best countries in the region for ensuring access to electricity for new businesses and paying taxes (Doing Business Report, 2019). Currently, FDI inflows in the UAE largely focus on investments in the oil and gas and digital technology sectors. FDI has also focused on the financial sector as it is one of the key contributors (8.64%) to the real economy (UAE Ministry of Economy, 2018). The government has also introduced new regulations for foreign investments and FDI inflows. The Ministry of Economy established a new FDI unit which allows certain industries to own 100% foreign investment (UAE Ministry of Economy, 2019a), and as a result, FDI stock rose by 8% between 2017 and 2018 which is 33% (USD140 billion) of national gross domestic product (GDP) (UAE Ministry of Economy, 2019b).

Mainly, the current study embarks on investigating the impacts of FDI inflows on the level of NPLs. FDI inflows is considered to be a new determinant of NPLs alongside other relevant determinants. It is projected that FDI inflows may reduce the size of NPLs during the economic crisis, while the combined effect of FDI

inflows and better institutions may not experience the reduction in the size of NPLs but rather increase the size of NPLs.

The present study discretely contributes to the literature. First contribution is to the literature by identifying the determinants of NPLs (Nkusu, 2011; Makri et al, 2014; Louzis et al, 2012). Second, it complements the existing literature by analyzing the factors that affect NPLs in an emerging country. Secondly, it contributes to the recent literature that identify some non-traditional determinants of NPLs such as institutional factors and related factors (Tanasković and Jandrić, 2015, Fang et al, 2011; Kauko, 2012). This study seeks to establish the link between FDI inflows and NPLs to gain an understanding of the channels through which FDI inflows affect NPLs in banks. An investigation into the impact of FDI inflows on NPLs can be used for macro-prudential regulations because it assists policymakers in understanding the implications of large FDI inflows on the banking sector, and can help policymakers in the formulation of pro-active policy response to mitigate any negative effect of FDI inflows on banks.

2. Literature review

2.1. Role of banks in facilitating FDI

FDI inflows in the financial sector are mostly channelled through banks which may hold or distribute FDI inflows to priority sectors. However, the lack of support from government and regulatory authorities of the host country may negatively affect FDI inflows into a country. Past studies have identified the key drivers of FDI, and concluded that economic size, economic growth, financial development, infrastructure, institutional development, economic freedom, distance between countries, cultural difference, inflation, openness and tax rates are some of the key drivers of FDI inflows (Salman and Hui 2009; Salman and Hui 2010; Yilmaz and Ozel 2014; Salman et al., 2016; Neha and Singhania, 2018). In the banking sector, Papi and Revoltella (1999) show that foreign direct investments are associated with high banking sector profitability. Strong banks can participate in multiple FDI projects but this may not be the case for weak banks. Klein et al (2002) observe that weak Japanese banks, (i.e., banks having financial difficulties) reduced the number of FDI projects they took on in the United States.

2.2 NPLs and its impact on banks

NPLs arise when the borrowers do not pay the banks' interest on loans for more than 3 months or during the maturity period mutually agreed between both parties in the loan agreement (Khan et al., 2020). In addition, a loan is considered to be 'nonperforming' where (i) income is not generated for a

long period of time, (ii) the principal and/or the interest is unpaid for at least 90 days (Fofack, 2005). The principal amount or interest are considered to be 'sub-standard' where loans are unpaid for at least 90 days, 'doubtful' if unpaid for at least 180 days and 'lost' if unpaid for at least a year, in which case, the bank may write-off the NPLs. It is a common practice by the banks to use NPLs as a credit measurement tool as a tool.

The past studies have critically determined the essentials of NPLs. Klein (2013) investigated the contributors of NPLs in European banks and found that weak institutions and poor macroeconomic performance leads to higher NPLs among European banks. GDP growth rate, unemployment and inflation were also significant factors affecting NPLs. Louzis et al. (2012), using dynamic panel data, analysed the rudiments of NPLs for the Greece banks, and finds that macroeconomic factors such as GDP, unemployment, interest rate and management quality were significant determinants of NPLs. Ozili (2019a), in a global study, investigate the nexus between financial development and NPLs, and find that higher levels of financial development primarily rely on higher NPLs. Jakubik and Reininger (2014) investigated the factors of NPLs in nine (9) central, eastern, south-eastern European (CESEE) regions using quarterly data from 2004 to 2012. The GMM estimation technique indicated that the exchange rate, the private credit to GDP ratio and one period lagged NPLs were positively related to NPLs whereas, real GDP growth and the domestic stock price index had a negative impact on NPLs. Ebeke and Loko (2014) investigate the impact of remittances on NPLs for 141 developing countries from 2000 to 2011. The country sample included low-income and middle-income countries. Using the ordinary least square (OLS) estimation technique, they find that NPLs and remittances have a negative correlation.

Roland et al. (2013) investigated macroeconomic factors' impact on NPLs for 75 countries from 2000 to 2010 through the GMM estimation technique. The interest and exchange rates, share prices and GDP growth had a significant positive effect on the size of NPLs. Ozili (2019b) examined the determinants of NPLs and compared it to European systemic and non-systemic banks. The findings revealed that comparatively profitable banks witnessed higher NPLs regardless of whether they are systemic or non-systemic. During economic booms, systemic banks indicated a lower NPLs while non-systemic banks experienced higher NPLs. Skarica (2014) investigated the effect of macroeconomic factors on NPLs in East European countries using quarterly panel data from 2007 to 2012. The findings reveal that unemployment and inflation rate positively influence on NPLs, and the reduction in NPLs was correlated with increasing real GDP growth.

Rajan and Dhal (2003) investigate macroeconomic variables' impact on NPLs in Indian banking sector. They find that, GDP growth rate, bank specific factors such as maturity, cost, credit terms,

banks' size and credit orientation impact on NPLs. Buncic and Melecky (2012) investigate the correlation between macroeconomic variables and NPLs for 54 countries, and find that real GDP growth, inflation and interest rates, fluctuations in the nominal US dollar exchange rates significantly effect on NPLs, whereas, fluctuations in nominal US dollar exchange rate for each country have no effect on NPLs. De Bock and Demyanets (2012) determined the fundamentals of NPLs in emerging economies using dynamic panel regression and structural panel vector autoregressive regression (VAR) techniques. They find that contraction in real GDP, depreciation in currency against US dollar and relatively weak trade conditions were the main contributors of NPLs. Saba et al. (2012) analyze the correlation between macroeconomic variables and NPLs in US banking system from 1985 to 2010, and find that per capita GDP, inflation rate and cumulative loans significantly effect on NPLs.

Nkusu (2011) empirically determined the NPLs in 26 advanced economies between 1998 to 2009, and concluded that adverse macroeconomic variables were the main contributors to escalate NPLs. Touny and Shehab (2015) analysed the NPLs for nine (9) Arab countries, namely, Egypt, Morocco, Tunisia, Jordan, Lebnon, Saudi Arabia, Kuwait, Oman and UAE from 2000-2012, and find that inflation, government spending and GDP growth negatively impact on NPLs while aggregate debt burden positively impacts on NPLs. Castro (2013) investigate the macroeconomic variables of credit risk for GIPSI countries (Greece, Ireland, Portugal, Spain and Italy). The findings reveal that a decline in GDP growth, share price, housing price indices and increase in unemployment, interest rate, real exchange rate and credit growth significantly increased NPLs size. Alternatively, Tanaskovic and Jandric (2015) show that macroeconomic and institutional factors such as foreign currency loan ratios and the exchange rate levels significantly increase the size of NPLs.

The review of above literature indicate that the findings are mixed across countries. These studies were concentrated on using macroeconomic factors such as GDP growth, inflation, lending rates, exchange rates and banks' specific characters such as maturity, cost and credit terms, bank's size as the variables to analyse its impact on NPLs. The review also indicates that the impact of FDI on NPLs has largely remained unexplored in the literature. Consequently, present study aims to bridge the existing gap by examining the relationship between FDI inflows and NPLs in the UAE.

2.3. *Hypotheses development*

Banks play an integral role in facilitating FDI inflows. The money received through FDI inflows enters a country mostly through banks, and these monies will form part of the deposit liability of banks. Banks will give out a large portion of these deposits as loans to borrowers as part of their asset-liability mismatching

process, and as a result, these loans will be exposed to credit risk and may not be repaid, giving rise to NPLs. This scenario leads to prediction of a positive relationship between FDI inflows and NPLs.

H1: FDI inflows are positively related to the size of NPLs.

Whereas, countries that operate well-established democratic systems tend to have independent judiciaries and strong legal systems that help to guarantee property rights, ensuring that investments (including FDI inflows) are secure for investors (Olson, 1993). Such protection for investors can compel banks to strengthen their credit risk management process to minimize loan defaults when they lend FDI deposits to borrowers. Bank managers understand that the courts will ensure that banks bear full liability for any resulting NPLs while protecting foreign investors and their foreign direct investments; therefore, banks, being aware of this, will put in some precaution in their lending activities to minimize the size of NPLs. Furthermore, the presence of strong monitoring and the imposition of lending constraints can also discourage banks from using FDI inflow deposits to create risky loans that give rise to NPLs. In such countries, higher FDI inflows tend to be associated with fewer NPLs due to the persistence of a strong legal system. Therefore, a negative relationship between FDI inflows and the size of NPLs is expected.

H2: FDI inflows are negatively related to the size of NPLs.

3. Method

3.1. Data collection

The collection of country-level data on bank performance is preferred over micro-bank data as the focus is on aggregate outcomes instead of individual bank performance while determining NPLs and the role of FDI inflows. NPLs data and other bank-level data for UAE is collected from the global financial development database of World Bank. The sample period lasts from 2008 to 2017 which is deemed satisfactory as it covers at least two full economic cycles. The data for real GDP growth rate are collected from the World Economic Forum archived in the World Bank database, while institutional data are collected from the World Governance Indicators database of the World Bank's database. Table 1a&b outline descriptive statistics of the sample data and the variable description.

3.2. Model specification

The baseline model is a multivariate model in equation 1. The model estimates NPLs as a function of FDI inflows, bank-specific factors and macroeconomic factors. The model is adopted from Beck et al (2015),

Anastasiou et al. (2019) and Ozili (2019a, b) while predicting different factors of NPLs under several contexts.

The functional form of the model is expressed below:

$$NPLt = \beta 1FDIt + \beta 2CRt + \beta 3UNEMPt + \beta 4GDPt + \beta 5NIMt + \beta 6LTDt + \beta 7EFFt + \beta 8CARt + e \ \ldots\ldots\ 1$$

$$NPLt = \beta 1FDIt + \beta 2CRt + \beta 3UNEMPt + \beta 4GDPt + \beta 5NIMt + \beta 6LTDt + \beta 7EFFt + \beta 8CARt + \beta 9CRISISt + \beta 10CRISISt * FDIt + e \ \ldots\ldots 2$$

$$NPLt = \beta 1FDIt + \beta 2CRt + \beta 3UNEMPt + \beta 4GDPt + \beta 5NIMt + \beta 6LTDt + \beta 7EFFt + \beta 8CARt + \beta 9COC + \beta 10RQ + \beta 11LAWt + \beta 12COCt * FDIt + \beta 13RQt * FDIt + \beta 14LAWt * FDIt + e \ \ldots\ldots\ 3$$

Where,

NPL = ratio of bank non-performing loans to gross loans (%);

FDI = foreign direct investment, net inflows (% of GDP);

FDC = foreign direct investment, net inflows (per capita);

EFF = bank cost to income ratio (%);

LTD = ratio of bank loan to bank deposits (%);

NIM = bank net interest margin (%);

CAR = ratio of bank regulatory capital to risk-weighted assets (%);

CR = ratio of private credit by deposit money banks to GDP (%);

GDP = gross domestic product growth rate (annual %);

UNEMP = unemployment rate;

COC = control of corruption index;

LAW = rule of law index, reflecting quality of legal system;

RQ = regulatory quality index;

t = year

The expected influence of these variables on NPLs is outlined in table 1a.

Table 1a: Definitions of variables and expected signs			
Variable	Definition	Expected sign	Source
FDI	foreign direct investment, net inflows (% of GDP)	(-)/(+)	World bank database
FDC	foreign direct investment, net inflows (per capita)	(-)/(+)	World bank database
CR	ratio of private credit by deposit money banks to GDP	(-)/(+)	Global Findex, World bank
UNEMP	unemployment rate	(+)	ILO statistics
GDP	real gross domestic product growth rate	(-)	World Economic Forum
NIM	net interest margin	(-)	Global Findex, World bank
LTD	bank loan to bank deposits ratio	(+)	Global Findex, World bank
EFF	bank cost to income ratio	(+)	Global Findex, World bank
CAR	regulatory capital to risk-weighted assets ratio	(-)/(+)	Global Findex, World bank
CRISIS	economic crisis indicator variable	(+)	Constructed by author
COC	Control of corruption	(-)/(+)	World Governance Indicators, World bank
RQ	Regulatory quality index	(-)/(+)	World Governance Indicator, World bank
LAW	Rule of law index, reflecting legal quality	(-)/(+)	World Governance Indicator, World bank

Ordinary least square (OLS) estimation technique is deployed for the estimation of this model. This study further introduced the first-difference Generalized Method of Moments (GMM) regression estimation as an alternative estimation to determine whether the OLS results are robust with the GMM estimation. The first-difference GMM estimation approach is adopted from Hauk and Wacziarg (2009), Beck et al (2015), Makri et al (2014) and Ozili (2019a&b). The regressions are estimated using a stepwise approach. The regression results are reported in section 4 while descriptive statistics and correlation results are reported in section 3.3.

3.3. Descriptive statistics and Correlations

Table 1 outlines the summary of the descriptive statistics for UAE banks between 1998 and 2017. NPLs are, on average, 8.46% which is a single-digit value and is therefore stable. Ideally, better credit risk management by UAE banks may reduce banks' credit risk exposure and reduce the amount of regulatory

capital (Tier 1 capital) they need to set aside for credit risks. A look at the CAR variable shows that the CAR for UAE banks is 18.44% which is greater than the NPLs ratio, and supports the argument that banks should keep more risk-capital to mitigate expected and unexpected NPLs. The CR and LTD variables are 53.21% and 99.08 respectively, which suggest that UAE banks engaged in large amounts of lending during the period. The NIM variable is 2.92 and indicates that UAE banks had a narrow interest margin during the period while the efficiency ratio (EFF) is 33.43%. The two macroeconomic variables (UNEMP and GDP) report low levels of economic growth and unemployment rates during the period.

Table 1b: Descriptive statistics for the NPL determinants

	FDI	CR	UNEMP	GDP	NIM	LTD	EFF	CAR	NPL
Mean	2.51	53.21	4.16	4.03	2.92	99.08	33.43	18.44	8.46
Median	2.52	53.44	3.79	4.10	2.88	97.58	33.10	18.95	6.58
Maximum	6.76	83.54	10.85	9.34	3.37	116.62	38.38	20.55	15.70
Minimum	1.16	30.15	-5.24	0.42	2.38	87.07	24.43	13.00	2.30
Std. Dev.	2.19	18.61	3.80	2.33	0.28	9.17	2.99	1.94	4.39
Skewness	0.36	0.27	-0.21	0.23	0.10	0.30	-1.07	-1.46	0.40
Kurtosis	2.43	1.62	3.37	2.59	2.23	1.738	5.25	4.71	1.69
Observations	20	20	20	20	20	20	20	20	20

Table 2a reports the results of Pearson correlation for the main theoretical variables. Table 2a also reports the associated t-statistics and p-values. The NIM variable is not significantly correlated with NPLs. The CR variable is significant and negatively correlated with NPLs for UAE banks, and implies that the increase in loan supply by UAE banks is associated with fewer NPLs. The CAR and EFF variables are significant and have a positive association with NPLs for UAE banks, implying that well-capitalized banks and efficient banks show higher NPLs. The GDP and UNEMP variables are insignificantly correlated with NPLs. The LTD variable is also found insignificantly correlated with NPLs. The correlation between institutional (or governance) variables is reported in table 2b. Overall, most of the correlation coefficients in Table 2a&b are considerably low which means that our results are free from the problems of multi-collinearity.

Table 2a: Correlation Table for NPL determinants

Coefficients	FDI	CR	UNEMP	GDP	NIM	LTD	EFF	CAR	NPL
FDI	1.00								

CR	0.01	1.00							
	(0.04)	-----							
	((0.96))	-----							
UNEMP	0.39*	-0.45**	1.00						
	(1.83)	(-2.17)	-----						
	((0.08))	((0.04))	-----						
GDP	0.59***	-0.33	0.64***	1.00					
	(3.13)	(-1.50)	(3.62)	-----					
	((0.01))	((0.15))	((0.002))	-----					
NIM	-0.16	0.15	0.17	0.05	1.00				
	(-0.73)	(0.64)	(0.75)	(0.21)	-----				
	((0.47))	((0.52))	((0.45))	((0.83))	-----				
LTD	-0.45**	0.12	-0.36	-0.03	-0.15	1.00			
	(-2.18)	(0.51)	(-1.66)	(-0.14)	(-0.67)	-----			
	((0.04))	((0.62))	((0.11))	((0.88))	((0.51))	-----			
EFF	-0.65***	-0.21	0.03	-0.29	-0.16	0.12	1.00		
	(-3.64)	(-0.93)	(0.14)	(-1.33)	(-0.71)	(0.55)	-----		
	((0.002))	((0.36))	((0.88))	((0.19))	((0.48))	((0.58))	-----		
CAR	-0.51**	0.01	-0.15	-0.34	0.45**	0.12	0.13	1.00	
	(-2.52)	(0.05)	(-0.66)	(-1.57)	(2.18)	(0.55)	(0.59)	-----	
	((0.02))	((0.95))	((0.52))	((0.13))	((0.04))	((0.58))	((0.56))	-----	
NPL	-0.32	-0.77***	0.21	-0.02	-0.03	-0.19	0.42*	0.46**	1.00
	(-1.44)	(-5.25)	(0.89)	(-0.08)	(-0.12)	(-0.84)	(1.96)	(2.19))	-----
	((0.17))	((0.00))	((0.38))	((0.93))	((0.91))	((0.41))	((0.06))	((0.04))	-----

p-values are reported in double parenthesis. T-statistics are reported in single parenthesis. ***, **, * denotes significance level at the 1%, 5% and 10%

4. Results and discussion

4.1. Impact of FDI inflows on NPLs

Table 3 (column 1 & 2) reports the impact of FDI on NPLs. The FDI coefficient is negative in columns 1&2. The observed negative relationship between FDI inflows and NPLs supports the second hypothesis (H2), but the FDI coefficient is statistically insignificant in columns 1 & 2 which implies that FDI inflows do not have a significant (negative) effect on the level of NPLs of UAE banks.

Moving on to control variables, the CR is negative and significant in columns 1 & 2 which indicates that higher levels of financial development are associated with fewer NPLs for UAE banks. This study is consistent with Anastasiou et al (2019) that found a negative relationship between financial development and NPLs while, it contradicts Ozili (2019a) findings that found a positive association between financial development (estimated as private credit by banks to GDP ratio) and NPLs. The UNEMP is negative and significant in columns 1 & 2 and indicates the existence of a negative relationship between the level of unemployment and NPLs in the UAE. This finding is inconsistent with the findings of Makri et al (2014).

The NIM is negative and significant in columns 1 & 2 which indicates that higher levels of profitability are associated with fewer NPLs. This finding is parallel with theory, and suggest that NPLs in banks will lower the interest income of banks as borrowers' default in the payment of principal or interest on loans. Anastasiou et al (2019) and Ozili (2019a) also find a negative association between bank profitability and the level of NPLs.

The LTD coefficient is found to have a negative and significant in columns 1 & 2 and confirms a negative relationship between the loan-to-deposit ratio and NPLs in the UAE. This finding is consistent with Makri et al (2014) and Anastasiou et al (2019) who find a negative association between LTD and NPL for banks in the Eurozone.

The GDP appears to have a positive and insignificant impact. This contradicts the studies of Tanasković and Jandrić (2015) and (Ozili, 2019b) find a negative association between GDP and NPLs. The CAR is positive and significant in columns 1 & 2, and indicates that banks with higher regulatory capital ratios create higher NPLs. This finding is intuitive because it suggests that banks in UAE that expect high levels of NPL will increase their regulatory capital ratios to mitigate expected losses from high credit risk, and this is finding is consistent with Ozili (2019b) who find similar result for systemic banks in the European Union. The EFF is positive and significant in columns 1 & 2 and indicates that a high cost-to-income ratio is significantly corelated to a high NPLs ratio for UAE banks. This finding also supports Ozili (2018) that confirms a positive association between banks' efficiency ratio and banks' performance and stability.

4.2. Further analysis

4.2.1. Effect of economic crisis

The UAE economy faced economic turmoil due to economic crisis in 2007 to 2010 and was bailed out by Abu Dhabi's oil wealth. This section analyses the effect of the economic crisis on the relationship between FDI inflows and NPLs in the UAE, to determine whether FDI inflows had a moderating effect on the level of NPLs during the 2007 to 2010 economic crisis. This analysis is similar to the studies that investigate the impact of financial crises (caused by economic failure or bank failure) on bank performance, and these studies show that the main channel through which financial crises affect bank performance is mainly through abnormal increase in NPLs (Ivashina and Scharfstein, 2010; Ozili and Thankom, 2018; Kauko, 2012; Ozili, 2019a; Abdelbaki, 2019). We test whether the association between FDI inflow and NPLs was weaker or stronger during the 2007 to 2010 economic crisis in the UAE. To do this, we introduced the CRISIS binary variable into the model (see equation 2) in section 4.1. The CRISIS binary variable takes the value '1' for year 2007, 2008, 2009 and 2010, and zero otherwise.

CRISIS variable is interacted with the FDI variable to determine whether economic crisis significantly influenced the relationship between FDI inflows and NPLs. The columns 3 & 4 of table 3 outline our findings. The CRISI*FDI coefficient is negative and significant in columns 1 & 2, and indicates that higher FDI inflows during the economic crisis led to fewer NPLs. This implies that higher FDI inflows helped to reduce the size of NPLs for UAE banks during the 2007 to 2010 economic crisis.

Table 3: Main Results				
	Impact of FDI inflow on NPLs		Effect of Financial Crisis	
	(1)	(2)	(3)	(4)
Estimation	OLS	GMM	OLS	GMM
Variable	(t-statistic)	(t-statistic)	(t-statistic)	(t-statistic)
FDI	-0.039 (-0.14)	-0.095 (-0.32)	0.250 (1.41)	0.781*** (3.91)
CR	-0.167*** (-9.36)	-0.161*** (-10.96)	-0.183*** (-12.49)	-0.208*** (-11.67)
UNEMP	-0.296*** (-4.47)	-0.366** (-3.05)	-0.325*** (-4.05)	-0.124 (-0.48)
GDP	0.395 (1.47)	0.545 (1.55)	0.238 (1.05)	-0.258 (-0.91)
NIM	-2.081*** (-3.09)	-2.094** (-3.01)	-1.900** (-2.67)	-1.707 (-1.25)
LTD	-0.151*** (-4.48)	-0.162*** (-5.15)	-0.126** (-2.39)	-0.121 (-1.09)
EFF	0.427*** (5.74)	0.442*** (6.35)	0.508*** (10.44)	0.619*** (5.57)
CAR	1.293*** (8.98)	1.309*** (8.54)	1.039*** (5.04)	0.831 (1.37)
CRISIS			1.384 (1.14)	7.762 (1.09)
CRISIS*FDI			-1.052*** (-5.72)	-3.332* (-1.82)
R^2	94.59	93.89	97.60	83.93
Adjusted R^2	91.43	90.01	95.44	67.85
Durbin-Watson	1.55	1.58	1.83	2.81
J-statistic		4.13		0.74
Prob.(J-statistic)		0.13		0.39

OLS = Ordinary least square regression with Newey west correction for autocorrelation and heteroscedasticity. GMM = Generalized method of moments estimation. The GMM estimator also includes the Newey-West correction for autocorrelation and heteroscedasticity. Variable description: EFF = Bank cost to income ratio (%); LTD = Bank loan to deposits ratio (%); NIM = Bank net interest margin (%); NPL = Bank non-performing loans to gross loans ratio (%); CAR = Bank regulatory capital to risk-weighted assets ratio (%); CR = ratio of private credit by deposit money banks to GDP (%); GDP = real GDP growth (annual %). The CRISIS variable takes the value '1' for year 2007, 2008, 2009 and 2010, and zero otherwise. ***, **, * denote significance at the 1%, 5% and 10% levels.

4.2.2. Effect of institutional or country governance factors

The literature shows that institutional factors can influence bank performance (Kanagaretnam et al, 2014; Fang et al, 2011; Zampara et al., 2017). Accordingly, we test the effect of country governance (or institutional) factors on the relationship between FDI inflows and NPLs for UAE banks (see equation 3). The result is outlined in table 4 and the variables of interest are the interaction variables in table 4. The LAW*FDI is positive and significant in the OLS estimation but is insignificant in the GMM estimation, therefore, the result is not robust to alternative estimation methods. The COC*FDI is positive and

insignificant, and indicates that corruption control does not have a significant effect on the association between FDI inflows and NPLs for UAE banks. The RQ*FDI is positive and significant at the 10% level, and shows that the joint effect of higher regulatory quality and higher FDI inflows is associated with higher NPLs for UAE banks. Therefore, it is submitted that regulatory quality has a significant effect on the association between FDI inflows and NPLs for UAE banks.

Table 4: Joint-effect of FDI inflows and country governance factors on NPLs

	(1)	(2)	(3)	(4)	(5)	(6)
Estimation	OLS	GMM	OLS	GMM	OLS	GMM
Variable	(t-statistic)	(t-statistic)	(t-statistic)	(t-statistic)	(t-statistic)	(t-statistic)
FDI	-1.337** (-2.83)	-4.978 (-1.33)	-1.232 (-1.23)	-4.110 (-1.70)	-0.997*** (-3.48)	-1.275** (-3.50)
CR	-0.165*** (-5.53)	-0.206** (-3.61)	-0.139 (-1.64)	-0.005 (-0.03)	-0.181*** (-7.63)	-0.196*** (-10.83)
UNEMP	-0.172 (-1.49)	0.234 (0.48)	-0.317** (-2.56)	-0.560 (-1.80)	-0.213** (-2.57)	-0.291** (-2.95)
GDP	0.093 (0.46)	-0.638 (-0.69)	0.232 (0.57)	0.101 (0.34)	0.133 (0.59)	0.133 (0.73)
NIM	-1.575** (-2.39)	-1.555 (-0.81)	-0.599 (-0.37)	3.986 (0.91)	0.347 (0.32)	1.198 (1.18)
LTD	-0.053* (-1.89)	0.019 (0.19)	-0.113* (-1.97)	-0.061 (-1.67)	-0.068*** (-3.59)	-0.064** (-3.14)
EFF	0.255** (2.03)	0.439 (1.33)	0.315** (2.11)	0.072 (0.24)	0.127 (1.01)	0.101 (1.32)
CAR	1.001*** (9.23)	0.989** (2.88)	1.086** (2.97)	0.537 (1.18)	0.998*** (8.07)	0.966*** (8.11)
LAW	1.546 (0.49)	-16.972 (-0.97)				
LAW*FDI	2.228** (2.80)	9.369 (1.32)				
COC			-2.901 (-0.51)	-15.268 (-1.39)		
COC*FDI			1.518 (0.94)	5.748 (1.76)		
RQ					3.199 (1.57)	3.180 (1.49)
RQ*FDI					0.866* (2.08)	1.159* (1.96)
R^2	97.15	69.14	92.72	85.51	97.34	97.23
Adjusted R^2	93.49	22.84	83.35	63.78	93.39	93.08
Durbin-Watson	2.44	2.50	1.98	2.88	2.03	2.56
J-statistic		0.29		0.44		2.59
Prob. (J-statistic)		0.58		0.51		0.11

OLS = Ordinary least square regression with Newey west correction for autocorrelation and heteroscedasticity. GMM = Generalized method of moments estimation. The GMM estimator also includes the Newey-West correction for autocorrelation and heteroscedasticity. Variable description: EFF = Bank cost to income ratio (%); LTD = Bank loan to bank deposits ratio (%); NIM = Bank net interest margin (%); NPL = Bank non-performing loans to gross loans ratio (%); CAR = Bank regulatory capital to risk-weighted assets (%); CR = Private credit by deposit money banks to GDP ratio (%); FDI = Foreign direct investment, net inflows (% of GDP); Unemployment, total (% of total labor force) (national estimate);

GDP = real GDP growth (annual %); COC = Control of Corruption; RQ = Regulatory Quality; LAW = Rule of Law. ***, **, * denote significance at the 1%, 5% and 10% levels.

4.2.3. Effect of bank characteristics

The further analysis is performed to determine whether bank-specific factors have a moderating effect on the association between FDI inflows and NPLs. The result is presented in table 5 and the variables of interest are the interaction variables in table 5. The NIM*FDI coefficient is positive and significant in the OLS estimation but is insignificant in the GMM estimation in columns 1 & 2. The conflicting signs indicate that the result is not robust to alternative estimation methods, and is therefore inconclusive. The LTD*FDI coefficient is negative in the OLS and GMM estimations but is insignificant in the OLS estimation and significant in the GMM estimation, thus, the result is therefore inconclusive. The CAR*FDI coefficient is not significant and reports conflicting signs in columns 7 & 8, which indicates that the result is inconclusive. The EFF*FDI is negative and significant in columns 3 & 4, and indicates that bank efficiency has a significant negative effect on the association between FDI inflows and NPLs for UAE banks. This implies that the combined effect of high cost-to-income ratio and FDI inflows reduces the size of NPLs for UAE banks, however, the reduction in NPLs is strongly driven by the FDI inflows (not the efficiency ratio) as shown by the significant FDI coefficient in column 3 & 4.

Table 5: Joint-effect of FDI inflows and banking sector characteristics on NPLs								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Estimation	OLS	GMM	OLS	GMM	OLS	GMM	OLS	GMM
Variable	(t-statistic)	(t-statistic)	(t-statistic)	(t-statistic)	(t-statistic)	(t-statistic)	(t-statistic)	(t-statistic)
FDI	-5.388** (-2.04)	-25.345** (-1.18)	1.506* (1.92)	-4.233* (-1.99)	2.086 (1.43)	6.763** (2.80)	-1.932 (-0.86)	16.784 (0.91)
CR	-0.178*** (-10.06)	-0.199*** (-7.38)	-147*** (-6.43)	-0.107** (-2.47)	-0.159*** (-8.78)	-0.141*** (-4.74)	-0.183*** (-9.86)	-0.032 (-0.16)
UNEMP	-0.287*** (-3.09)	0.080 (0.18)	-0.305*** (-3.59)	-0.339* (-1.84)	-0.262** (-2.80)	-0.154 (-0.72)	-0.312*** (-3.53)	-0.290 (-0.54)
GDP	0.247 (0.83)	-1.147 (-0.94)	0.529 (1.69)	0.749 (1.75)	0.364 (1.57)	0.239 (0.84)	0.279 (1.05)	1.625 (0.89)
NIM	-6.664** (-2.93)	-25.072 (-1.37)	-2.869*** (-3.67)	-4.046** (-2.29)	-2.424*** (-3.16)	-3.227** (-2.30)	-1.976** (-2.64)	-2.787 (-1.01)
LTD	-0.091* (-2.05)	0.171 (0.67)	-0.183*** (-4.05)	-0.249*** (-3.69)	-0.119** (-2.74)	-0.049 (-0.96)	-0.119** (-2.68)	-0.445 (-1.34)
EFF	0.656*** (6.37)	1.540 (1.68)	0.551*** (5.61)	0.768*** (3.54)	0.383*** (4.23)	0.285*** (3.26)	0.483*** (9.12)	-0.057 (-0.08)
CAR	1.270*** (10.79)	1.046** (2.84)	1.298*** (8.23)	1.301*** (6.11)	1.242*** (9.57)	1.119*** (7.77)	1.058*** (4.45)	3.434 (1.39)
NIM*FDI	2.054* (2.02)	9.954 (1.19)						
EFF*FDI			-0.052* (-1.75)	-0.141* (-2.08)				
LTD*FDI					-0.022 (-1.45)	-0.072** (-2.74)		
CAR*FDI							0.117 (0.92)	-1.048 (-0.88)
R^2	96.27	81.64	95.23	92.67	95.36	91.06	95.06	45.12
Adjusted R^2	93.56	66.94	91.76	86.80	91.99	83.91	91.48	1.22
Durbin-Watson	1.74	2.92	1.68	1.18	1.84	1.95	1.44	2.59
J-statistic		1.56				0.002		0.001
Prob. (J-statistic)		0.21		0.28		0.96		0.99

OLS = Ordinary least square regression with Newey west correction for autocorrelation and heteroscedasticity. GMM = Generalized method of moments estimation. The GMM estimator also includes the Newey-West correction for autocorrelation and heteroscedasticity. Variable description: EFF = Bank cost to income ratio (%); LTD = Bank loan to bank deposits ratio (%); NIM = Bank net interest margin (%); NPL = Bank non-performing loans to gross loans ratio (%); CAR = ratio of bank regulatory capital to risk-weighted assets (%); CR = ratio of private credit by deposit money banks to GDP (%); FDI = Foreign direct investment, net inflows (% of GDP); Unemployment, total (% of total labor force) (national estimate); GDP = real GDP growth (annual %); ***, **, * denote significance at the 1%, 5% and 10% levels.

4.2.4. Alternative measure of FDI: FDI inflows per capita (FDC)

Finally, an alternative measure of foreign direct investment – the FDI per capita variable is introduced. The FDI inflow per capita (FDC) variable measures the benefit of FDI inflows to each member of population. This variable is derived by dividing the FDI inflows value (in USD) by the population size. All the estimations using FDC as the alternative measure of FDI inflows were reperformed. Table 6, 7 and 8 reports the results. The results in table 6 are consistent with the earlier results in table 3, in other words, the FDI and FDC coefficients are negative and insignificant in tables 3 and 6. Also, the CRISIS*FDC coefficient in table 6 (using the FDC variable) further confirms that FDI inflows helped to reduce the size of NPLs during the UAE economic crisis. Finally, the interaction analyses using the FDC variable are not consistent with

the results in tables 7 and 8 as they produce insignificant results. Therefore, the main conclusions are drawn from the earlier results.

(insert table 6, 7 & 8)

4.3. Robustness

The GMM regressions as robust alternative to the OLS estimations are preferred as it allows to confirm that the OLS results are robust to alternative regression estimation such as the GMM. The GMM estimation deals with potential endogeneity among the regressors. More importantly, the Newey-West correction for autocorrelation and heteroscedasticity was applied to all the OLS and GMM regressions from Table 1 to Table 8 to ensure that the standard errors are robust.

5. Conclusion

This study investigated the impact of FDI inflows on bank NPLs in the UAE while controlling for relevant NPL determinants. The findings confirm that, although FDI inflows did not have a direct and significant impact on NPLs, FDI inflows reduced the size of NPLs during the economic crisis. Also, the joint effect of FDI inflows and better institutions did not reduce the size of NPLs but rather increased the size of NPLs. Moreover, the combined effect of higher bank efficiency and greater FDI inflows reduced the size of NPLs for banks.

One implication of the study is that, since FDI inflows appear to have a moderating role in reducing the size of NPLs during economic crisis years, policy makers and regulators should formulate policies that encourage FDI inflows into the country. Another implication of this study is that, given the importance of FDI inflows, bank regulators should assess the channels through which FDI inflows affect banks' loan portfolio, and they should determine whether strict regulations or lending constraints should be imposed on banks particularly banks that are the largest beneficiary of large FDI inflow deposits.

Finally, the findings of this study suggest some directions for future research. Future studies, using micro-bank data, can compare banks that receive large FDI inflows with banks that receive smaller FDI inflows, and determine whether there is any differential impact of FDI inflows on NPLs for the two bank groups. Another research may analyze the impact of FDI inflows on the NPLs of banks in Middle Eastern and North African (MENA) countries

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Appendix

Table 2b: Pearson correlation for institutional variables

Correlation	COC	CR	CRISIS	FDC	FDI	RQ	NPL	LAW
COC	1.00							

CR	0.59***	1.00						
	(2.76)	-----						
	((0.02))	-----						
CRISIS	0.06	0.15	1.00					
	(0.23)	(0.56)	-----					
	((0.82)	((0.58))	-----					
FDC	0.77***	0.11	-0.07	1.00				
	(4.62)	(0.39)	(-0.28)	-----				
	((0.00)	((0.69))	((0.78))	-----				
FDI	0.49**	-0.33	-0.11	0.83***	1.00			
	(2.08)	(-1.29)	(-0.39)	(5.63)	-----			
	((0.05))	((0.22))	((0.69))	((0.00))	-----			
RQ	0.16	-0.01	-0.16	0.13	0.32	1.00		
	(0.63)	(-0.03)	(-0.61)	(0.51)	(1.26)	-----		
	((0.54))	((0.97))	((0.54))	((0.62))	((0.22))	-----		
NPL	-0.70***	-0.67***	-0.53**	-0.52**	-0.11	0.223	1.00	
	(-3.68)	(-3.38)	(-2.38)	(-2.26)	(-0.42)	(0.88)	-----	
	((0.003))	((0.01))	((0.03))	((0.04))	((0.67))	((0.39))	-----	
LAW	-0.24	-0.33	-0.61***	-0.14	0.09	0.69***	0.68***	1.00
	(-0.94)	(-1.31)	(-2.89)	(-0.54)	(0.37)	(3.61)	(3.51)	-----
	((0.36))	((0.21))	((0.01))	((0.60))	((0.71))	((0.003))	((0.003))	-----

Table 6: Main results using the FDI per capita as dependent variable				
	Impact of FDI inflow on NPLs		Effect of Financial Crisis	
	(1)	(2)	(3)	(4)
Estimation	OLS	GMM	OLS	GMM
Variable	(t-statistic)	(t-statistic)	(t-statistic)	(t-statistic)
FDC	-0.322 (-0.75)	-0.095 (-0.32)	0.152 (0.36)	1.515** (2.41)
CR	-0.159*** (-6.76)	-0.161*** (-10.96)	-0.185*** (-7.39)	-0.236*** (-9.04)
UNEMP	-0.223* (-2.19)	-0.366** (-3.05)	-0.333* (-2.08)	-0.489* (-2.07)
GDP	0.403 (1.66)	0.545 (1.55)	0.304 (1.30)	0.089 (0.38)
NIM	-2.051** (-2.28)	-2.094** (-3.01)	-1.559 (-1.63)	-0.839 (-0.43)
LTD	-0.139*** (-4.67)	-0.162*** (-5.15)	-0.106 (-1.77)	-0.099 (-0.62)
EFF	0.433*** (5.87)	0.442*** (6.35)	0.543*** (10.49)	0.738*** (4.19)
CAR	1.285*** (9.35)	1.309*** (8.54)	0.800*** (3.29)	0.057 (0.07)
CRISIS			1.287*** (3.73)	39.428*** (2.03)
CRISIS*FDC			-2.092*** (-4.27)	-6.812* (-1.96)
R^2	94.21	93.89	97.01	81.87
Adjusted R^2	90.16	90.01	93.64	58.57
Durbin-Watson	1.46	1.58	1.69	2.59
J-statistic		4.13		1.249
Prob.(J-statistic)		0.13		0.26

OLS = Ordinary least square regression with Newey west correction for autocorrelation and heteroscedasticity. GMM = Generalized method of moments estimation. The GMM estimator includes the Newey-West correction for autocorrelation and heteroscedasticity. Variable description: EFF = Bank cost to income ratio (%); LTD = Bank loan to bank deposits ratio (%); NIM = Bank net interest margin (%); NPL = Bank non-performing loans to gross loans ratio (%); CAR = Bank regulatory capital to risk-weighted assets ratio (%); CR = ratio of private credit by deposit money banks to GDP (%); GDP = real GDP growth (annual %). FDC = Foreign direct investment inflow per capita, defined as FDI divided by total population size. ***, **, * denote significance at the 1%, 5% and 10% levels.

Table 7: Joint-effect of FDI per capita and country governance factors on NPLs						
	(1)	(2)	(3)	(4)	(5)	(6)
Estimation	OLS	GMM	OLS	GMM	OLS	GMM
Variable	(t-statistic)	(t-statistic)	(t-statistic)	(t-statistic)	(t-statistic)	(t-statistic)
FDC	-1.518 (-1.63)	-2.107 (-1.46)	-0.618 (-0.28)	-16.991 (-0.41)	-0.766 (-0.95)	-2.059* (-2.39)
CR	-0.131*** (-3.18)	-0.145** (-3.45)	-0.185** (-2.71)	-0.093 (-0.29)	-0.138*** (-3.39)	-0.186*** (-6.38)
UNEMP	-0.016 (-0.13)	-0.072 (-0.85)	-0.261 (-1.31)	-1.508 (-0.35)	-0.070 (-0.54)	-0.247* (-2.44)
GDP	0.204 (0.87)	0.291 (0.94)	0.437 (1.09)	-0.068 (-0.08)	0.319 (1.48)	0.213 (1.06)
NIM	-1.143 (-1.10)	-0.561 (-0.59)	-1.863 (-1.32)	8.223 (0.24)	0.464 (0.34)	2.282 (1.74)
LTD	-0.007 (-0.17)	0.028 (0.51)	-0.131 (-0.97)	0.634 (0.35)	-0.066* (-2.44)	-0.031 (-1.35)
EFF	0.206 (1.73)	0.176 (1.09)	0.436*** (3.78)	-0.194 (-0.10)	0.099 (0.82)	0.181 (1.52)
CAR	0.895*** (6.76)	0.849** (9.59)	1.288*** (5.59)	0.851 (0.59)	0.931*** (7.09)	0.961*** (7.81)
LAW	-0.285 (-0.03)	-0.989 (-0.05)				
LAW*FDC	1.556 (0.84)	2.075 (0.65)				
COC			-3.309 (0.17)	-172.14 (-0.39)		
COC*FDC			-0185 (-0.05)	30.191 (0.39)		
RQ					9.011 (0.76)	-4.925 (-0.41)
RQ*FDC					-0.471 (-0.27)	1.751 (0.96)
R^2	96.90	98.56	91.80	-1.07	97.81	98.06
Adjusted R^2	92.25	95.96	79.49	-4.81	94.54	94.58
Durbin-Watson	1.43	2.96	1.66	2.64	1.83	2.91
J-statistic		1.84		0.47		3.06
Prob. (J-statistic)		0.17		0.49		0.08

OLS = Ordinary least square regression with Newey west correction for autocorrelation and heteroscedasticity. GMM = Generalized method of moments estimation. The GMM estimator includes the Newey-West correction for autocorrelation and heteroscedasticity. Variable description: EFF = Bank cost to income ratio (%); LTD = Bank loan to bank deposits ratio (%); NIM = bank net interest margin (%); NPL = Bank non-performing loans to gross loans ratio (%); CAR = ratio of bank regulatory capital to risk-weighted assets (%); CR = ratio of private credit by deposit money banks to GDP (%); FDC = foreign direct investment inflow per capita, defined as FDI divided by total population size; Unemployment, total (% of total labor force) (national estimate); GDP = real GDP growth (annual %); COC = Control of Corruption; RQ = Regulatory Quality; LAW = Rule of Law. . ***, **, * denote significance at the 1%, 5% and 10% levels.

Table 8: Joint-effect of FDI per capita and banking sector characteristics on NPLs								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Estimation	OLS	GMM	OLS	GMM	OLS	GMM	OLS	GMM
Variable	(t-statistic)	(t-statistic)	(t-statistic)	(t-statistic)	(t-statistic)	(t-statistic)	(t-statistic)	(t-statistic)
FDC	0.939 (1.69)	0.570 (0.36)	0.998 (1.01)	0.400 (0.29)	1.579 (1.26)	1.374 (0.94)	0.787 (0.54)	0.433 (0.30)
CR	-0.145*** (-6.43)	-0.154*** (-11.26)	-0.137*** (-5.01)	-0.151*** (-10.44)	-0.140*** (-5.40)	-0.152*** (-9.42)	-0.143*** (-6.49)	-0.154*** (-11.40)
UNEMP	-0.185 (-1.59)	-0.333** (-2.62)	-0.186 (-1.56)	-0.323** (-2.33)	-0.107** (-0.73)	-0.234 (-1.40)	-0.180 (-1.55)	-0.322** (-2.39)
GDP	0.442* (1.93)	0.651* (-1.84)	0.491* (2.06)	0.656* (1.84)	0.419 (2.15)	0.559 (1.79)	0.456* (2.11)	0.640 (1.80)
NIM	1.334 (0.37)	0.562 (0.22)	-2.924*** (-2.93)	-2.440* (-1.82)	-3.013*** (-2.64)	-2.882* (-2.13)	-2.547* (-2.02)	-2.361 (-1.79)
LTD	-0.171*** (-4.42)	-0.183*** (-8.17)	-0.175*** (-5.23)	-0.178*** (-8.31)	-0.014** (-0.16)	-0.046 (-0.46)	-0.171*** (-4.82)	-0.181*** (-8.24)
EFF	0.318* (2.13)	0.374** (3.23)	0.681*** (4.11)	0.599*** (3.57)	0.292*** (2.55)	0.337*** (3.11)	0.340** (2.75)	0.394*** (3.99)
CAR	1.222*** (6.96)	1.310*** (6.77)	1.221 (-1.41)	1.313*** (6.94)	1.159*** (7.94)	1.234*** (7.34)	1.753*** (3.58)	1.685*** (4.75)
NIM*FDC	-0.582 (-0.88)	-0.434 (-0.83)						
EFF*FDC			-0.053 (-1.41)	-0.031 (-0.86)				
LTD*FDC					-0.026 (-1.59)	-0.028 (-1.43)		
CAR*FDC							-1.753 (-0.96)	-0.056 (-0.83)
R^2	94.79	94.00	95.30	94.29	95.68	95.22	94.94	93.98
Adjusted R^2	90.16	88.01	91.13	88.59	91.85	90.43	90.25	87.95
Durbin-Watson	1.79	1.94	1.98	3.99	2.06	2.20	1.88	1.95
J-statistic		3.92				4.19		3.89
Prob. (J-statistic)		0.05		0.05		0.04		0.05

OLS = Ordinary least square regression with Newey west correction for autocorrelation and heteroscedasticity. GMM = Generalized method of moments estimation. The GMM estimator includes the Newey-West correction for autocorrelation and heteroscedasticity. Variable description: EFF = Bank cost to income ratio (%); LTD = Bank loan to bank deposits ratio (%); NIM = Bank net interest margin (%); NPL = Bank non-performing loans to gross loans ratio (%); CAR = Bank regulatory capital to risk-weighted assets ratio (%); CR = ratio of Private credit by deposit money banks to GDP (%); FDC = Foreign direct investment inflow per capita, defined as FDI divided by total population size; Unemployment, total (% of total labor force) (national estimate); GDP = real GDP growth (annual %); ***, **, * denote significance at the 1%, 5% and 10% levels.