








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

AUTHORS	Peterson K. Ozili  https://orcid.org/0000-0001-6292-1161  https://publons.com/researcher/1572634/peterson-ozili/ Asma Salman  http://orcid.org/0000-0002-5623-3087  https://publons.com/researcher/1394287/asma-salman-phd/ Qaisar Ali  https://orcid.org/0000-0002-6825-650X  https://publons.com/researcher/3828984/qaisar-ali/
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Qaisar Ali, 2020

Peterson K. Ozili, Ph.D., Senior
Economist, Central Bank of Nigeria,
Abuja, Nigeria.

Asma Salman, Ph.D., Associate
Professor of Finance, College of
Business Administration, American
University in the Emirates, UAE.
(Corresponding author)

Qaisar Ali, Ph.D. Candidate, Faculty
of Islamic Economics and Finance,
Universiti Islam Sultan Sharif Ali,
Brunei Darussalam.



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Peterson K. Ozili (Nigeria), Asma Salman (UAE), Qaisar Ali (Brunei Darussalam)

THE IMPACT OF FOREIGN DIRECT INVESTMENT INFLOWS ON NONPERFORMING LOANS: THE CASE OF UAE

Abstract

The banking sector is at risk of worsening loan quality, which is a major threat to the financial system's stability. The impact of foreign direct investment (FDI) inflows on nonperforming loans (NPLs) in the United Arab Emirates (UAE) is empirically investigated in this study. The data from 2008 to 2017 are collected and analyzed through the ordinary least squares (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 and contribute to the literature to establish a relationship between FDI inflows and NPLs by examining the relationship 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 Classification

C23, E44, G21, G10

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 & Outa, 2017; Louzis et al., 2012). Therefore, controlling the size of NPLs is a signatory for optimal bank performance. The literature has identified several determinants of NPLs classified as bank-specific determinants and macroeconomic determinants (Berger & 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, and financial development levels (Tanasković & Jandrić, 2015; Fang et al., 2011; Ozili, 2019a; 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 nonperforming 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 to both developed and developing countries to economic development strategies (Jensen, 2003). Hence, FDI inflows are considered a vital component of capital inflows for developing countries as these drive technological progress facilitated by improved production techniques (Peres et al., 2018; UNCTAD, 2004).

The political and economic stability of the UAE has consistently attracted new FDI from less stable countries. FDI inflows in the UAE increased by USD 31 million between 2017 and 2018 and are estimated at USD 10.3 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). As a result, FDI stock rose by 8% between 2017 and 2018, which is 33% (USD 140 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 are considered 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. The first contribution is made 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 identifies some non-traditional determinants of NPLs such as institutional factors and related factors (Tanasković & Jandrić, 2015; Fang et al., 2011; Kauko, 2012). This study seeks to establish the link between FDI inflows and NPLs to understand 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 policy-makers in understanding the implications of large FDI inflows on the banking sector and can help policy-makers in the formulation of the pro-active policy response to mitigate any negative effect of FDI inflows on banks.

1. LITERATURE REVIEW

1.1. Role of banks in facilitating FDI

FDI inflows in the financial sector are mostly channeled 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 & Hui, 2008, 2010; Yilmaz & Ozel, 2014; Salman et al., 2016; Neha & 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.

1.2. 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). Besides, a loan is considered to be 'nonperforming' where (1) income is not generated for a long time, (2) the principal and/or the interest is unpaid for at least 90 days (Fofack, 2005). The principal amount of interest is considered '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.

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 lead 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, analyzed the rudiments of NPLs for the Greek 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, investigates 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 squares (OLS) estimation technique, they find that NPLs and remittances are negatively correlated.

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 them 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 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 NPLs, and the reduction in NPLs was correlated with increasing real GDP growth.

Rajan and Dhal (2003) investigate macroeconomic variables' impact on NPLs in the Indian banking sector. They find that GDP growth rate, bank-specific factors such as maturity, cost, credit terms, banks' size, and credit orientation impact 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 affect NPLs. In contrast, fluctuations in nominal US dollar exchange rate for each country do not affect 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 the 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 the US banking system from 1985 to 2010 and find that per capita GDP, inflation rate, and cumulative loans significantly affect NPLs.

Nkusu (2011) empirically determined the NPLs in 26 advanced economies between 1998 and 2009 and concluded that adverse macroeconomic variables were the main contributors to escalate NPLs. Touny and Shehab (2015) analyzed the NPLs for nine (9) Arab countries, namely, Egypt, Morocco, Tunisia, Jordan, Lebanon, Saudi Arabia, Kuwait, Oman, and the UAE from 2000 to 2012, and find that inflation, government spending, and GDP growth negatively impact NPLs, while aggregate debt burden positively impacts 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 the above literature indicates 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, and bank size as the variables to analyze its impact on NPLs. The review also indicates that the impact of FDI on NPLs has largely remained unexplored in the literature. Consequently, the present study aims to bridge the existing gap by examining the relationship between FDI inflows and NPLs in the UAE.

1.3. 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 the prediction of a positive relationship between FDI inflows and NPLs.

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

The countries that operate well-established democratic systems tend to have independent judiciaries and strong legal systems that help 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, 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.

2. METHODOLOGY

2.1. 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 are collected from the World Bank's global financial development database. 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. Tables 1 and 2 outline descriptive statistics of the sample data and the variable description.

2.2. 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 as follows:

$$NPL_t = \beta_1 FDI_t + \beta_2 CR_t + \beta_3 UNEMP_t + \beta_4 GDP_t + \beta_5 NIM_t + \beta_6 LTD_t + \beta_7 EFF_t + \beta_8 CAR_t + e, \quad (1)$$

$$\begin{aligned}
 NPL_t = & \beta_1 FDI_t + \beta_2 CR_t + \\
 & + \beta_3 UNEMP_t + \beta_4 GDP_t + \beta_5 NIM_t + \\
 & + \beta_6 LTD_t + \beta_7 EFF_t + \beta_8 CAR_t + \\
 & + \beta_9 CRISIS_t + \beta_{10} CRISIS_t \cdot FDI_t + e,
 \end{aligned} \quad (2)$$

$$\begin{aligned}
 NPL_t = & \beta_1 FDI_t + \beta_2 CR_t + \\
 & + \beta_3 UNEMP_t + \beta_4 GDP_t + \beta_5 NIM_t + \\
 & + \beta_6 LTD_t + \beta_7 EFF_t + \beta_8 CAR_t + \\
 & + \beta_9 COC + \beta_{10} RQ + \beta_{11} LAW_t + \\
 & + \beta_{12} COC_t \cdot FDI_t + \beta_{13} RQ_t \cdot FDI_t + \\
 & + \beta_{14} LAW_t \cdot FDI_t + e,
 \end{aligned} \quad (3)$$

where NPL = Ratio of bank nonperforming 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; LAW = Rule of Law, reflecting quality of legal system; RQ = Regulatory Quality; t = year.

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

The ordinary least squares (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 3, while descriptive statistics and correlation results are reported in subsection 2.3.

2.3. Descriptive statistics and correlations

Table 2 outlines a 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, suggesting 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 1. 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 the author
COC	Control of Corruption	(-)/(+)	World Governance Indicators, World Bank
RQ	Regulatory Quality	(-)/(+)	World Governance Indicator, World Bank
LAW	Rule of Law, reflecting legal quality	(-)/(+)	World Governance Indicator, World Bank

Table 2. 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 3 reports the results of the 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 UAE banks' increase in loan supply 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 4. Overall, most of the correlation coefficients in Tables 3 and 4 are considerably low, which means that the results are free from multi-collinearity problems.

Table 3. Correlation table for NPL determinants

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

Note: *p*-values are reported in double parentheses. *t*-statistics are reported in single parentheses. ***, **, * denote significance at 1%, 5%, and 10% levels.

Table 4. Pearson correlation for institutional variables

Correlation	COC	CR	CRISIS	FDC	FDI	RQ	NPL	LAW
COC	1.00							
	–							
CR	0.59***	1.00						
	(2.76)	–						
CRISIS	0.06	0.15	1.00					
	(0.23)	(0.56)	–					
FDC	0.77***	0.11	–0.07	1.00				
	(4.62)	(0.39)	(–0.28)	–				
FDI	0.49**	–0.33	–0.11	0.83***	1.00			
	(2.08)	(–1.29)	(–0.39)	(5.63)	–			
RQ	0.16	–0.01	–0.16	0.13	0.32	1.00		
	(0.63)	(–0.03)	(–0.61)	(0.51)	(1.26)	–		
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)	–	
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))	–

3. RESULTS AND DISCUSSION

3.1. Impact of FDI inflows on NPLs

Table 5 (columns 1 and 2) reports the impact of FDI on NPLs. The FDI coefficient is negative in columns 1 and 2. The observed negative relationship between FDI inflows and NPLs supports *H2*, but the FDI coefficient is statistically insignificant in columns 1 and 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 and 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's (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 and 2 and indicates 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 and 2, which indicates that higher levels of profitability are associated with fewer NPLs. This finding is in parallel with theory and suggests that NPLs in banks will lower banks' interest income 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 negative and significant in columns 1 and 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) who find a negative association between GDP and NPLs. The *CAR* is positive and significant

in columns 1 and 2, which indicates that banks with higher regulatory capital ratios create higher NPLs. This finding is intuitive because it suggests that banks in the UAE that expect high levels of NPL will increase their regulatory capital ratios to mitigate expected losses from high credit risk, and this finding is consistent with Ozili (2019b) who finds a similar result for systemic banks in the European Union. The *EFF* is positive and significant in columns 1 and 2 and indicates that a high cost-to-income ratio is significantly correlated to a high NPLs ratio for UAE banks. This finding also supports Ozili (2018) who confirms a positive association between banks' efficiency ratio and banks' performance and stability.

3.2. Further analysis

3.2.1. Effect of economic crisis

The UAE economy faced economic turmoil due to an economic crisis from 2007 to 2010 and was bailed out by Abu Dhabi's oil wealth. This section analyzes 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 2007–2010 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 an abnormal increase in NPLs (Ivashina & Scharfstein, 2010; Ozili & Thankom, 2018; Kauko, 2012; Ozili, 2019a; Abdelbaki, 2019). It is tested whether the association between FDI inflow and NPLs was weaker or stronger during the 2007–2010 economic crisis in the UAE. To do this, the *CRISIS* binary variable was introduced into the model (see equation (2)) in subsection 2.2. The *CRISIS* binary variable takes the value '1' for 2007, 2008, 2009, and 2010, and zero otherwise.

CRISIS variable interacts with the *FDI* variable to determine whether economic crisis significantly influenced the relationship between FDI inflows and NPLs. Columns 3 and 4 of Table 5 outline the findings. The *CRISIS*FDI* coefficient is negative and significant in columns 1 and 2, which indicates that higher FDI inflows during the economic

crisis led to fewer NPLs. This implies that higher FDI inflows helped reduce the size of NPLs for UAE banks during the 2007–2010 economic crisis.

3.2.2. 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, one tests 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 6, and the variables of interest are the interaction variables in Table 6. 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, indicating that corruption control does not significantly affect 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 significantly affects the association between FDI inflows and NPLs for UAE banks.

3.2.3. Effect of bank characteristics

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 7, and the variables of interest are the interaction variables in Table 7. The *NIM*FDI* coefficient is positive and significant in the OLS estimation but is insignificant in the GMM estimation in columns 1 and 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 and 8, which indicates that the result is inconclusive. The *EFF*FDI* is negative and significant in columns 3 and 4, which indicates that

Table 5. Main results

Estimation	Impact of FDI inflows on NPLs		Effect of the financial crisis	
	(1)	(2)	(3)	(4)
	OLS	GMM	OLS	GMM
Variable	(t-statistic)	(t-statistic)	(t-statistic)	(t-statistic)
FDI	-0.039	-0.095	0.250	0.781***
	(-0.14)	(-0.32)	(1.41)	(3.91)
CR	-0.167***	-0.161***	-0.183***	-0.208***
	(-9.36)	(-10.96)	(-12.49)	(-11.67)
UNEMP	-0.296***	-0.366**	-0.325***	-0.124
	(-4.47)	(-3.05)	(-4.05)	(-0.48)
GDP	0.395	0.545	0.238	-0.258
	(1.47)	(1.55)	(1.05)	(-0.91)
NIM	-2.081***	-2.094**	-1.900**	-1.707
	(-3.09)	(-3.01)	(-2.67)	(-1.25)
LTD	-0.151***	-0.162***	-0.126**	-0.121
	(-4.48)	(-5.15)	(-2.39)	(-1.09)
EFF	0.427***	0.442***	0.508***	0.619***
	(5.74)	(6.35)	(10.44)	(5.57)
CAR	1.293***	1.309***	1.039***	0.831
	(8.98)	(8.54)	(5.04)	(1.37)
CRISIS			1.384	7.762
			(1.14)	(1.09)
CRISIS*FDI			-1.052***	-3.332*
			(-5.72)	(-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

Note: OLS = Ordinary least squares 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 nonperforming 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.

Table 6. Joint-effect of FDI inflows and country governance factors on NPLs

Estimation	(1)	(2)	(3)	(4)	(5)	(6)
	OLS	GMM	OLS	GMM	OLS	GMM
Variable	(t-statistic)	(t-statistic)	(t-statistic)	(t-statistic)	(t-statistic)	(t-statistic)
<i>FDI</i>	-1.337** (-2.83)	-4.978 (-1.33)	-1.232 (-1.23)	-4.110 (-1.70)	-0.997*** (-3.48)	-1.275** (-3.50)
<i>CR</i>	-0.165*** (-5.53)	-0.206** (-3.61)	-0.139 (-1.64)	-0.005 (-0.03)	-0.181*** (-7.63)	-0.196*** (-10.83)
<i>UNEMP</i>	-0.172 (-1.49)	0.234 (0.48)	-0.317** (-2.56)	-0.560 (-1.80)	-0.213** (-2.57)	-0.291** (-2.95)
<i>GDP</i>	0.093 (0.46)	-0.638 (-0.69)	0.232 (0.57)	0.101 (0.34)	0.133 (0.59)	0.133 (0.73)
<i>NIM</i>	-1.575** (-2.39)	-1.555 (-0.81)	-0.599 (-0.37)	3.986 (0.91)	0.347 (0.32)	1.198 (1.18)
<i>LTD</i>	-0.053* (-1.89)	0.019 (0.19)	-0.113* (-1.97)	-0.061 (-1.67)	-0.068*** (-3.59)	-0.064** (-3.14)
<i>EFF</i>	0.255** (2.03)	0.439 (1.33)	0.315** (2.11)	0.072 (0.24)	0.127 (1.01)	0.101 (1.32)
<i>CAR</i>	1.001*** (9.23)	0.989** (2.88)	1.086** (2.97)	0.537 (1.18)	0.998*** (8.07)	0.966*** (8.11)
<i>LAW</i>	1.546 (0.49)	-16.972 (-0.97)				
<i>LAW*FDI</i>	2.228** (2.80)	9.369 (1.32)				
<i>COC</i>			-2.901 (-0.51)	-15.268 (-1.39)		
<i>COC*FDI</i>			1.518 (0.94)	5.748 (1.76)		
<i>RQ</i>					3.199 (1.57)	3.180 (1.49)
<i>RQ*FDI</i>					0.866* (2.08)	1.159* (1.96)
<i>R²</i>	97.15	69.14	92.72	85.51	97.34	97.23
Adjusted <i>R²</i>	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
<i>J</i> -statistic		0.29		0.44		2.59
Prob. (<i>J</i> -statistic)		0.58		0.51		0.11

Note: OLS = Ordinary least squares 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 nonperforming 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); *UNEMP* = 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.

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 re-

duces 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 columns 3 and 4.

Table 7. Joint-effect of FDI inflows and banking sector characteristics on NPLs

Estimation	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	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)
<i>FDI</i>	-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)
<i>CR</i>	-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)
<i>UNEMP</i>	-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)
<i>GDP</i>	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)
<i>NIM</i>	-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)
<i>LTD</i>	-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)
<i>EFF</i>	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)
<i>CAR</i>	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)
<i>NIM*FDI</i>	2.054* (2.02)	9.954 (1.19)						
<i>EFF*FDI</i>			-0.052* (-1.75)	-0.141* (-2.08)				
<i>LTD*FDI</i>					-0.022 (-1.45)	-0.072** (-2.74)		
<i>CAR*FDI</i>							0.117 (0.92)	-1.048 (-0.88)
<i>R²</i>	96.27	81.64	95.23	92.67	95.36	91.06	95.06	45.12
Adjusted <i>R²</i>	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
<i>J</i> -statistic		1.56				0.002		0.001
Prob. (<i>J</i> -statistic)		0.21		0.28		0.96		0.99

Note: OLS = Ordinary least squares 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 nonperforming 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); *UNEMP* = Unemployment, total (% of total labor force) (national estimate); *GDP* = Real GDP growth (annual %). ***, **, * denote significance at the 1%, 5%, and 10% levels.

3.2.4. 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 inflows per capita (FDC) variable measures FDI inflows' benefit to each member of the 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. Tables 8, 9, and 10 report the re-

sults. The results in Table 8 are consistent with the earlier results in Table 4; in other words, the FDI and FDC coefficients are negative and insignificant in Tables 4 and 8. Also, the *CRISIS*FDC* coefficient in Table 8 (using the *FDC* variable) further confirms that FDI inflows helped 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 9 and 10 as they produce insignificant results. Therefore, the main conclusions are drawn from the earlier results.

Table 8. Main results using the FDI per capita as the dependent variable

Estimation	Impact of FDI inflows on NPLs		Effect of financial crisis	
	(1)	(2)	(3)	(4)
	OLS	GMM	OLS	GMM
Variable	(t-statistic)	(t-statistic)	(t-statistic)	(t-statistic)
FDC	-0.322	-0.095	0.152	1.515**
	(-0.75)	(-0.32)	(0.36)	(2.41)
CR	-0.159***	-0.161***	-0.185***	-0.236***
	(-6.76)	(-10.96)	(-7.39)	(-9.04)
UNEMP	-0.223*	-0.366**	-0.333*	-0.489*
	(-2.19)	(-3.05)	(-2.08)	(-2.07)
GDP	0.403	0.545	0.304	0.089
	(1.66)	(1.55)	(1.30)	(0.38)
NIM	-2.051**	-2.094**	-1.559	-0.839
	(-2.28)	(-3.01)	(-1.63)	(-0.43)
LTD	-0.139***	-0.162***	-0.106	-0.099
	(-4.67)	(-5.15)	(-1.77)	(-0.62)
EFF	0.433***	0.442***	0.543***	0.738***
	(5.87)	(6.35)	(10.49)	(4.19)
CAR	1.285***	1.309***	0.800***	0.057
	(9.35)	(8.54)	(3.29)	(0.07)
CRISIS			1.287***	39.428***
			(3.73)	(2.03)
CRISIS*FDC			-2.092***	-6.812*
			(-4.27)	(-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

Note: OLS = Ordinary least squares 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 nonperforming 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 9. Joint-effect of FDI per capita and country governance factors on NPLs

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

Note: OLS = Ordinary least squares 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 nonperforming 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; *UNEMP* = 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 10. Joint-effect of FDI per capita and banking sector characteristics on NPLs

Estimation	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	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)
<i>FDC</i>	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)
<i>CR</i>	-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)
<i>UNEMP</i>	-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)
<i>GDP</i>	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)
<i>NIM</i>	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)
<i>LTD</i>	-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)
<i>EFF</i>	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)
<i>CAR</i>	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)
<i>NIM*FDC</i>	-0.582 (-0.88)	-0.434 (-0.83)						
<i>EFF*FDC</i>			-0.053 (-1.41)	-0.031 (-0.86)				
<i>LTD*FDC</i>					-0.026 (-1.59)	-0.028 (-1.43)		
<i>CAR*FDC</i>							-1.753 (-0.96)	-0.056 (-0.83)
<i>R²</i>	94.79	94.00	95.30	94.29	95.68	95.22	94.94	93.98
Adjusted <i>R²</i>	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
<i>J</i> -statistic		3.92				4.19		3.89
Prob. (<i>J</i> -statistic)		0.05		0.05		0.04		0.05

Note: OLS = Ordinary least squares 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 nonperforming 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; *UNEMP* = Unemployment, total (% of total labor force) (national estimate); *GDP* = real GDP growth (annual %); ***, **, * denote significance at the 1%, 5%, and 10% levels.

3.3. Robustness

The GMM regressions as a robust alternative to the OLS estimations are preferred as it allows confirming 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 10 to ensure that the standard errors are robust.

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 directly and significantly impact 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 inflows 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 FDI inflows' impact on the NPLs of banks in Middle Eastern and North African (MENA) countries.

AUTHOR CONTRIBUTIONS

Conceptualization: Asma Salman, Qaisar Ali.

Data curation: Peterson K. Ozili.

Formal analysis: Peterson K. Ozili, Asma Salman.

Funding acquisition: Peterson K. Ozili, Asma Salman, Qaisar Ali.

Methodology: Qaisar Ali.

Project administration: Asma Salman.

Software: Peterson K. Ozili, Qaisar Ali.

Supervision: Peterson K. Ozili, Asma Salman.

Writing – original draft: Peterson K. Ozili, Asma Salman, Qaisar Ali.

Writing – review & editing: Peterson K. Ozili, Asma Salman, Qaisar Ali.

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