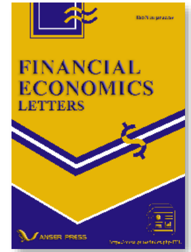
Financial Economics Letters

Homepage: https://www.anserpress.org/journal/fel



The Impact of COVID-19 on Commercial Bank Borrowers in Arab Economies

Turki Rashed Alshammari [a,*]

[a] *Financial Management Program, Department of Business Administration, College of Business Administration, University of Hafr Al-Batin, Hafar Al-Batin, Saudi Arabia*

ABSTRACT

This study investigates the impact of COVID-19 on bank borrowers across 22 Arab economies from 2017 to 2022, employing the two-step system GMM estimator. The findings reveal a significant negative effect of COVID-19 on the number of bank borrowers, highlighting a sharp decline in borrowing activity due to the pandemic's economic disruptions. Notably, the decline was more pronounced in non-GCC countries, where economic structures and pandemic responses differed. Robustness tests, including subsample analysis and alternative econometric models (pooled OLS, fixed effects, random effects, and 2SLS), consistently confirm these results. The study emphasizes the need for targeted policy interventions to stabilize financial systems, reduce borrowing costs, and control exchange rate fluctuations to maintain credit access during crises. The findings provide crucial insights for policymakers aiming to support economic recovery and strengthen the resilience of the banking sector in the face of future external shocks.

KEYWORDS

COVID-19; Bank Borrowers; Banking Indicators; Arab Economies

---

* Corresponding author: Turki Rashed Alshammari
E-mail address: t.rashed@uhb.edu.sa

ISSN 2972-3426
doi: 10.58567/fel04010001
This is an open-access article distributed under a CC BY license
(Creative Commons Attribution 4.0 International License)

Received 26 October 2024; Accepted 29 November 2024; Available online 11 February 2025; Version of Record 15 March 2025

1. Introduction

The emergence of the COVID-19 pandemic in late 2019 sent unprecedented shockwaves through the commercial banking sector in Arab economies. As the pandemic unfolded, its profound economic and social consequences became increasingly apparent. Arab economies, characterized by diverse economic structures ranging from oil-dependent nations to those reliant on tourism and remittances, were particularly vulnerable to the cascading effects of the global health crisis. The pandemic triggered a complex web of challenges for borrowers, fundamentally altering the financial landscape across the region. The rapid spread of the virus necessitated stringent lockdowns and economic shutdowns, leading to sharp declines in economic activity. Businesses in sectors such as tourism, hospitality, and retail faced dramatic revenue losses, straining their ability to meet loan obligations (Saif-Alyousfi, 2022, 2024, 2025a, 2025b; Kotcharin et al., 2023; Zhao et al., 2023). Meanwhile, sectors like healthcare, technology, and e-commerce experienced heightened demand, demonstrating remarkable resilience amid the turmoil (Guo and Tseng, 2023; Amiri et al., 2023; Susamto et al., 2023). This divergence in sectoral impacts significantly reshaped borrowing patterns and transformed the risk profiles of commercial bank borrowers in Arab economies.

The crisis revealed stark disparities in borrowers' experiences, highlighting both vulnerabilities and opportunities. Small and medium enterprises (SMEs), often considered the backbone of Arab economies, were disproportionately affected due to limited access to alternative financing sources and weaker financial buffers. In contrast, larger firms with diversified operations were better positioned to weather the storm. For commercial banks, the challenges were equally profound. They faced the dual task of supporting struggling borrowers while safeguarding their financial stability. Banks were compelled to reassess lending practices and risk management strategies, adopting innovative approaches to sustain their operations and mitigate risks. Governments across the region implemented various measures, including stimulus packages, loan moratoriums, and targeted fiscal interventions, to alleviate financial pressures on borrowers (Aliani et al., 2022; Dursun-de Neef and Schandlbauer, 2021). While these interventions provided short-term relief, their long-term implications for borrowers' financial stability and banks' risk exposure remain uncertain, warranting a closer examination.

A significant development during this period was the accelerated adoption of digital banking solutions. Social distancing measures and restrictions on in-person interactions necessitated a rapid shift to digital platforms. This transformation facilitated smoother interactions between borrowers and banks, enabling online transactions, virtual loan applications, and remote banking services (Park and Shin, 2021; Çolak and Öztekin, 2021). However, it also brought new challenges, including cybersecurity risks and data privacy concerns, which added complexity to the already volatile financial landscape. The pandemic highlighted the need for resilience and adaptability, both for borrowers and lenders, underscoring the critical role of digital transformation in shaping the future of banking.

Despite the extensive research on the economic repercussions of the COVID-19 pandemic, including its impact on financial markets, energy prices, global trade, and socioeconomic outcomes (Saif-Alyousfi, 2022; Kotcharin et al., 2023; Zhao et al., 2023), a significant gap remains in understanding the pandemic's specific effects on commercial bank borrowers in Arab economies. This gap is particularly noteworthy given the pivotal role of banks in these economies. Unlike in more diversified financial systems, banks in Arab economies are not merely intermediaries but serve as vital pillars of economic stability. They provide critical credit to businesses, support investment activities, and ensure the efficient functioning of markets. The unique economic structures and sectoral dependencies of Arab economies further underscore the importance of understanding how borrowers navigated the challenges posed by the pandemic. Addressing this gap is essential for developing effective policy responses and strategies to enhance financial resilience.

The motivation for this study stems from the need to explore this underexamined area and provide a comprehensive understanding of the pandemic's implications for commercial bank borrowers in Arab economies.

While some studies have explored the pandemic's effects on global banking systems (Guo and Tseng, 2023; Amiri et al., 2023; Susamto et al., 2023; Gulati et al., 2023; Tran et al., 2023; Silva et al., 2023; Gao et al., 2023; Boubakri et al., 2023; Aizenman et al., 2023; Degryse and Huylebroek, 2023; Anani and Owusu, 2023; Aliani et al., 2022; Dursun-de Neef and Schandlbauer, 2021, 2022; Çolak and Öztekin, 2021; Park and Shin, 2021), they often focus on broader trends, leaving the specific challenges faced by borrowers in Arab economies largely unexamined. This research seeks to fill this void by delving into the nuanced experiences of borrowers during the pandemic, shedding light on their challenges, adaptations, and long-term strategies. By examining sector-specific impacts and borrower behaviors, the study aims to contribute to the broader discourse on economic resilience and adaptability in the face of global crises.

This study offers several key contributions to the existing literature. First, it expands the existing literature on the economic impacts of COVID-19 by focusing on the underexplored dynamics between the pandemic and bank borrowers in Arab economies. Second, by analyzing borrower data and examining sector-specific impacts, the study provides a nuanced understanding of how borrowers adapted their financial strategies and risk management approaches during the crisis. Third, it offers actionable insights for policymakers, financial institutions, and regulators to develop tailored strategies that enhance borrower resilience and ensure financial stability in the face of future economic disruptions.

The findings of this study underscore the substantial impact of COVID-19 on commercial bank borrowers in Arab economies. The research reveals a significant negative effect of the pandemic on borrowing behavior, highlighting the challenges faced by borrowers in accessing and servicing credit. It also identifies a positive correlation between GDP growth and the number of borrowers, indicating the critical role of economic expansion in driving credit demand. Additionally, the study observes a negative relationship between exchange rates and borrowing, reflecting the increased costs and risks associated with currency fluctuations. These findings emphasize the need for targeted policy responses to stabilize borrowing costs, support credit access, and foster resilience across sectors.

The remainder of this document is structured as follows: Section 2 reviews the literature, identifying research gaps. Section 3 describes the data and methodology. Section 4 presents findings on borrowers' challenges and adaptations during the pandemic. Section 5 concludes with policy recommendations to enhance borrower resilience and financial stability.

2. Literture review

The COVID-19 pandemic has significantly disrupted economies worldwide, including the banking sector, making its impact on bank borrowers and financial stability a critical area of research. This review synthesizes key studies to highlight the interplay of factors influencing the banking sector during the pandemic, avoiding a fragmented listing of individual works.

The global contraction in bank lending during the pandemic is a recurring theme. Studies like Çolak and Öztekin (2021) reveal that lending declines were driven by severe COVID-19 impacts, financial conditions, market structures, and regulatory responses. Similarly, Park and Shin (2021) link these lending declines to increased nonperforming loans (NPLs), particularly in emerging markets, where economic instability and rising debt amplified financial vulnerabilities.

In Europe, local exposure to COVID-19 and bank capitalization levels shaped lending practices, as seen in Dursun-de Neef and Schandlbauer (2021). Banks with lower capital adequacy ratios often increased lending in high-risk areas, while more robustly capitalized banks reduced their activity, potentially mitigating long-term risks. Their findings align with research indicating that capitalization and market conditions are central to banks' resilience during economic downturns.

Household consumption patterns also played a pivotal role in bank dynamics during the pandemic. For example, Dursun-de Neef and Schandlbauer (2022) illustrate how declines in consumer spending led to increased deposits and subsequent growth in real estate lending. These findings underscore the interconnectedness of household financial health, bank deposits, and lending, emphasizing the role of macroeconomic policies in stabilizing banking systems.

The comparative performance of different banking models has also been studied extensively. Aliani et al. (2022) highlight that Islamic banks in the Gulf Cooperation Council (GCC) countries exhibited greater stability compared to conventional banks, driven by lower volatility in stock returns. This resilience, attributed to Islamic financial principles, suggests alternative frameworks for mitigating financial stress during crises. Similarly, Boubakri et al. (2023) find that robust macroprudential regulations enhanced Islamic banks' performance relative to their conventional counterparts during the pandemic.

Risk management and lending adjustments are recurring themes in the literature. Guo and Tseng (2023) show how banks raised loan rates and enhanced monitoring efforts in response to heightened COVID-19 exposure. This mirrors findings from other studies emphasizing that prudent lending and monitoring strategies are vital during crises. Likewise, Tran et al. (2023) highlight liquidity hoarding among U.S. banks as a successful strategy to enhance stability, reflecting a broader trend toward conservative financial practices.

Regional perspectives offer valuable insights into how banks adapted to pandemic-induced shocks. In Indonesia, Susamto et al. (2023) note the resilience of government-owned banks compared to private institutions, highlighting the role of ownership structures and supportive policies in mitigating financial stress. Similarly, Gao et al. (2023) explore how pandemic exposure in China increased banks' funding costs, underscoring the importance of regional economic conditions in shaping financial strategies.

Digital transformation emerged as a critical response to the pandemic, as highlighted by Silva et al. (2023) in Brazil. The acceleration of digital banking solutions not only enabled continuity in operations but also reshaped lending practices, reflecting a broader shift in consumer and institutional behaviors. This theme complements findings on banks' adaptive strategies, such as prioritizing liquidity and risk management.

Beyond institutional responses, the pandemic's social implications within the banking sector have also been explored. Amiri et al. (2023) find that while COVID-19 did not directly affect bank employees' well-being, it influenced life satisfaction through its impact on physical health. This highlights the broader human and cultural dimensions of banking practices during crises, often overshadowed by financial metrics.

The role of government interventions during the pandemic is also well-documented. Studies such as Degryse and Huylebroek (2023) emphasize that liquidity support alone was insufficient to safeguard financial stability. Instead, comprehensive policies, including direct financial assistance and broader economic measures, were necessary to mitigate risks. Similarly, Aizenman et al. (2023) show that high public debt levels diluted the effectiveness of government spending on lending activities, raising questions about fiscal sustainability and its implications for financial institutions.

Bank resilience during the pandemic was significantly influenced by regulatory frameworks. Anani and Owusu (2023) demonstrate that higher pre-crisis capital ratios reduced banks' risk profiles, reinforcing the importance of robust regulations in enhancing financial stability. This finding ties into broader discussions on the interplay between capitalization, regulatory environments, and institutional responses to economic shocks.

In summary, the literature highlights the complex interplay of factors—ranging from market structures and regulatory frameworks to digital transformation and social dimensions—that shaped the banking sector's response to the pandemic. Key themes include the importance of prudent risk management, the resilience of Islamic banking models, the role of macroeconomic policies, and the transformative potential of digitalization. Together, these insights provide a comprehensive understanding of how financial institutions adapted to the pandemic, offering

valuable lessons for future crises.

3. Data and methodology

3.1. Data

This study employs a comprehensive dataset that includes 22 Arab countries: Algeria, Bahrain, Comoros, Djibouti, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Mauritania, Morocco, Oman, Palestine, Qatar, Saudi Arabia, Somalia, Sudan, Syria, Tunisia, the United Arab Emirates, and Yemen. Spanning the period from 2017 to 2022, the dataset is enriched by variables derived from the reputable World Bank database, which guarantees the robustness and reliability of the data quality. By utilizing this diverse range of countries, the study aims to capture a broad spectrum of economic and social dynamics within the Arab region. The choice of the World Bank as a primary source further reinforces the study's commitment to high-quality, standardized data, facilitating comparative analyses across different contexts. This methodological rigor not only enhances the credibility of the findings but also allows for a deeper understanding of the intricate relationships among the variables studied. Overall, the dataset provides a solid foundation for exploring the impact of various factors on economic outcomes in these diverse Arab nations.

3.2. Model Specification

To examine the impact of COVID-19 on bank borrowers in Arab economies, the following dynamic model is estimated:

$$Borrowers_{j,t} = \alpha_i + \beta_1 Borrowers_{j,t-1} + \beta_2 COVID-19_t + \beta_3 GDP_{j,t} + \beta_4 ExchangeRates_{j,t} + \beta_5 UnemploymentRate_{j,t} + \varepsilon_{i,j,t} \quad (1)$$

where, "j" represents the country at a specific year "t". The variables "Borrowers" denote the number of borrowers with commercial banks per 1 adult measured by natural logarithm, as dependent variable. "COVID-19" signifies the pandemic itself. Additionally, "GDP," "ExchangeRates," and "UnemploymentRate" stand for gross domestic product, exchange rates, and unemployment rate, respectively, acting as control variables within the study. The unique error term is denoted by εi,j,t, capturing any idiosyncratic variability within the analysis.

Building upon previous banking research by Saif-Alyousfi (2021; 2022; 2023, 2024), Saif-Alyousfi and Saha, (2021), and Saif-Alyousfi et al. (2020; 2021a; 2021b; 2021c; 2022; 2023), this study utilizes the two-step system generalized method of moments (GMM) estimator to estimate Model (1). Table 1 provides a detailed outline of the variable measurements employed in this analysis.

The GMM estimator is specifically chosen to address common challenges encountered in banking data estimation, including endogeneity, unobserved heterogeneity, autocorrelation, and performance persistence—issues that fixed effects models struggle to adequately resolve. The study opts for the system GMM estimator over the difference GMM estimator due to its ability to manage unit root properties and deliver more reliable results, as highlighted by Bond (2002). Additionally, the two-step GMM estimator is preferred over its one-step counterpart, as it offers greater efficiency in addressing the problem of weak instruments (Saif-Alyousfi et al., 2023, 2020; 2021). Windmeijer (2005) further supports this choice by demonstrating that the two-step estimator yields more accurate inferences with reduced bias and lower standard errors compared to the one-step version.

To validate the model's robustness, the Hansen test is employed to assess the over-identifying restrictions, thereby ensuring the appropriateness of the instruments used. Furthermore, lagged predetermined variables spanning a one-year period are included to confirm the absence of second-order autocorrelation in the estimation

process.

Table 1. Definition of variables.

Variables	Description	Source
Dependent variables:		
Bank borrowers	Natural logarithm of number of borrowers from commercial banks per 1, adults	WDI
Independent variables:		
COVID-19	COVID-19 is dummy variable that takes 1 if the year 2020 and 0 otherwise	
GDP growth	Real GDP growth rate	WDI
Exchange rate	The twelve-month average exchange rate	WDI
Unemployment rate	The percentage of the labour force that is unemployed is known as the unemployment rate.	WDI

4. Empirical results

4.1. Descriptive analysis

Table 2 offers a detailed overview of the descriptive statistics for the key variables used in the analysis, highlighting significant variability among the observed Arab countries during the specified period. The logarithm of bank borrowers shows substantial variation, with a mean of 4.48 and a standard deviation of 1.22, indicating a wide range in the number of borrowers across different periods. The binary COVID-19 variable has a mean of 0.17, reflecting the sporadic nature of COVID-19-related factors impacting these countries. GDP growth exhibits considerable fluctuations, ranging from -21.40 to 8.74, with an average of 1.31 and a standard deviation of 4.58, underscoring the economic volatility experienced across the sampled nations. In terms of exchange rates, the data reveals significant variability, with values ranging from 0.32 to 2397.99, a mean of 130.97, and a standard deviation of 333.30, reflecting diverse trends in currency valuation. Furthermore, the unemployment rate varies notably, spanning from 0.10 to 28.48, with an average of 9.60 and a standard deviation of 7.71, highlighting disparities in labor market conditions across the countries. Collectively, these statistics illustrate the extensive variability and fluctuations in critical economic indicators, emphasizing the diverse economic and social contexts within the Arab nations during the study period, which is essential for understanding the broader impacts of economic policies and the COVID-19 pandemic on the banking sector and borrowers.

Table 2. Descriptive statistics.

Variable	Observation	Mean	SD	Min	Max
Log of bank borrowers	132	4.48	1.22	1.73	6.44
COVID-19	132	0.17	0.37	0.00	1.00
GDP growth	132	1.31	4.58	-21.40	8.74
Exchange rate	132	130.97	333.30	0.32	2397.99
Unemployment rate	132	9.60	7.71	0.10	28.48

4.2. Correlation analysis

Table 3 presents the correlation coefficients among the key variables in this study, offering initial insights into the relationships between COVID-19, economic indicators, and bank borrowers in the observed Arab countries. The negative correlation between bank borrowers and COVID-19 (-0.267) highlights how the pandemic has adversely impacted lending dynamics, possibly due to heightened economic uncertainty, reduced borrower confidence, and stricter lending criteria adopted by banks during the crisis. Similarly, the significantly negative correlation with the exchange rate (-0.496) suggests that currency depreciation may deter borrowing, either by increasing the cost of

servicing foreign-denominated loans or reducing domestic purchasing power. The strong negative correlation between COVID-19 and GDP growth (-0.476) underscores the pandemic's substantial impact on economic performance, aligning with global observations of economic contractions during COVID-19 waves. Interestingly, the weak negative correlation between COVID-19 and the unemployment rate (-0.130) warrants further interpretation. While the decline in unemployment might seem counterintuitive during a pandemic, it could reflect temporary government interventions, such as fiscal stimulus measures or employment retention schemes, that cushioned job losses. The negligible correlation between GDP growth and exchange rates (0.029) indicates that exchange rate fluctuations are not directly associated with economic growth in this context, potentially due to the complex interplay of other factors such as trade balances, inflation, and capital flows. On the other hand, the moderate positive correlation between unemployment and exchange rates (0.305) suggests that currency depreciation might exacerbate unemployment by increasing costs for import-dependent sectors, thus impacting labor markets.

Importantly, all correlation coefficients among the independent variables are below 0.50, indicating a low risk of multicollinearity. This statistical independence ensures that the variables can be incorporated into regression models without concerns about redundancy or distortions in parameter estimates. However, while correlation analysis provides valuable preliminary insights, it does not imply causation. For example, the observed relationships between COVID-19 and economic indicators could reflect bidirectional or mediated effects. Therefore, these findings serve as a foundation for more robust analyses, including regression models and causal inference techniques, to disentangle the complex interrelationships shaping banking dynamics in the studied countries.

In sum, the correlation analysis highlights key relationships among the study variables, but its interpretative power is limited. By complementing these findings with more advanced econometric methods, the study aims to uncover deeper insights into the mechanisms driving the observed patterns. This approach ensures a comprehensive understanding of the pandemic's impact on banking and economic stability in Arab countries.

Table 3. Correlation analysis.

Variables	Bank borrowers	COVID-19	GDP growth	Exchange rate	Unemployment rate
Bank borrowers	1				
COVID-19	-0.267	1			
GDP growth	0.057	-0.476	1		
Exchange rate	-0.496	-0.130	-0.029	1	
Unemployment rate	-0.195	0.034	0.029	0.305	1

4.3. Results

Table 4 provides a detailed analysis of the estimated effects of COVID-19 and other critical variables on the number of bank borrowers across Arab economies, utilizing the two-step system Generalized Method of Moments (GMM) methodology. The coefficients presented in this table reflect both the magnitude and the direction of the impact each variable exerts on the borrower count. Importantly, the results from the Hansen test, alongside the AR(1) and AR(2) tests, validate that the GMM approach has been properly specified and is free from identification issues. These tests confirm the robustness of the individual lag two-step GMM coefficient estimations, establishing confidence in the results derived from this analysis.

A particularly noteworthy finding from the analysis is the negative coefficient associated with lagged bank borrowers (t-1), which holds statistical significance at the 5% level. This outcome reveals a clear inverse relationship between past and current borrower numbers, indicating that a reduction in the previous period's borrower figures corresponds to a decrease in current borrowers. This finding highlights the dynamic nature of

borrower engagement, emphasizing the importance of historical borrower trends in shaping current financial behavior. The evidence supports the appropriateness of using a dynamic model in this context, reinforcing the concept of persistence in measuring bank borrowers within these economies.

Furthermore, the coefficient linked to COVID-19 demonstrates a highly significant negative effect on the number of bank borrowers, reaching a significance level of 1%. This substantial finding underscores a strong correlation: as COVID-19-related factors escalate, there is a marked decline in the count of borrowers. The statistical robustness associated with this result accentuates the reliability of this relationship and illustrates the pronounced and adverse impact of the pandemic on the borrower landscape within the examined Arab economies. Such findings illuminate the direct influence of external economic shocks on banking activities, drawing attention to critical aspects of how pandemics can substantially reshape borrower engagement in financial systems.

The implications of these results resonate with the expectations outlined by the authors and align closely with the conclusions of numerous studies that have explored the impact of COVID-19 on the banking sector. Research by Guo and Tseng (2023), Amiri et al. (2023), Susamto et al. (2023), Gulati et al. (2023), Tran et al. (2023), Silva et al. (2023), Gao et al. (2023), Boubakri et al. (2023), Aizenman et al. (2023), Degryse and Huylebroek (2023), Anani and Owusu (2023), Aliani et al. (2022), and Dursun-de Neef and Schandlbauer (2021, 2022) collectively underscore the detrimental effects of the pandemic on the banking sector. The findings from this study corroborate the broader understanding established in the literature, confirming that the pandemic has significantly and negatively impacted the number of bank borrowers within the context of Arab economies.

Moreover, the convergence of these findings across diverse studies fortifies the understanding of the widespread repercussions of the pandemic on the banking landscape. It becomes evident that COVID-19 not only disrupted individual borrowers but also contributed to broader economic uncertainties that could lead to a reduction in banking activities. This highlights the necessity for policymakers and financial institutions to develop strategies that mitigate such impacts in future crises, ensuring that banking systems remain resilient and capable of supporting borrowers during challenging times.

The positive and statistically significant impact of Gross Domestic Product (GDP) on the number of bank borrowers at the 5% significance level indicates that as GDP rises, there is a corresponding increase in the number of individuals and businesses seeking loans from banks. This relationship is driven by several interconnected factors. During periods of economic growth, businesses are more likely to expand operations or invest in new projects, both of which typically necessitate financial support through borrowing. As GDP grows, consumer confidence also tends to increase, leading to heightened spending on major purchases like homes, cars, or education, often funded through loans. Additionally, favorable economic conditions usually align with lower interest rates, which central banks may implement to stimulate borrowing and investment. These lower rates make loans more attractive, encouraging both individuals and businesses to engage in borrowing activities. Thus, the rise in GDP creates an environment conducive to borrowing, where increased financial activity reflects broader economic health. This dynamic illustrates the interconnectedness of economic growth and the demand for credit, emphasizing how robust economic performance not only facilitates but also drives the need for loans across various sectors. Consequently, understanding this relationship is crucial for policymakers and financial institutions aiming to foster sustainable economic development and address the evolving demands of borrowers in a growing economy.

The negative and statistically significant relationship between the exchange rate and the number of bank borrowers at the 1% level reveals an important dynamic in the studied Arab economies. Specifically, as exchange rates rise, there is a notable decline in the number of individuals and businesses seeking loans. This inverse correlation can be attributed to several factors that influence borrowing behaviors in response to currency fluctuations. Increased exchange rates often lead to higher borrowing costs for businesses and individuals, making loans less attractive and deterring borrowing activities. Additionally, a rising exchange rate may signal economic

instability or uncertainty, prompting potential borrowers to adopt a more cautious approach towards financial commitments. This heightened uncertainty can reduce the overall demand for loans from financial institutions, as borrowers may prioritize financial prudence in unpredictable economic conditions. Furthermore, exchange rate volatility can create a more challenging environment for businesses reliant on imports or foreign currency transactions, further exacerbating the reluctance to incur additional debt. Thus, the findings underscore the intricate interplay between currency fluctuations and borrowing behaviors, emphasizing the significant role that exchange rate dynamics play in shaping the borrowing landscape within these economies. Understanding this relationship is crucial for policymakers and financial institutions aiming to navigate the impacts of currency movements on lending practices and economic stability in the region.

The lack of statistical significance in the coefficient of the unemployment rate suggests that fluctuations in unemployment may not have a considerable impact on the number of bank borrowers in the analyzed Arab economies. Several factors could explain this finding. Firstly, borrowing decisions may be influenced by a range of financial needs or the availability of alternative funding sources, making them less sensitive to short-term changes in unemployment rates. For instance, individuals and businesses might rely on personal savings, family support, or other financial instruments that do not directly correlate with employment status. Additionally, government policies, such as economic stimulus programs or social safety nets, may mitigate the effects of unemployment on borrowing behaviors, allowing individuals and businesses to maintain access to credit even during downturns. Furthermore, specific industry conditions or the overall health of financial markets could overshadow the influence of unemployment rates, as sectors may experience varying levels of demand and credit access independent of joblessness. As such, understanding the interplay among these diverse factors is essential for clarifying why changes in unemployment rates do not appear to significantly affect borrowing patterns in these economies. This insight highlights the complexity of borrowing behavior and the need for a multifaceted approach when analyzing economic dynamics in the context of lending practices.

Table 4. The effect of COVID-19 on bank borrowers using two-step system GMM.

Variables	Number of borrowers
Lag Bank borrowers $_{t-1}$	-0.178**
	(0.069)
COVID-19	-1.542***
	(0.464)
GDP	0.045**
	(0.018)
Exchange rate	-0.063***
	(0.006)
Unemployment rate	-0.007
	(0.015)
Constant	5.232***
	(0.212)
Observations	88
Hansen test (P-value)	0.303
AR1 test (P-value)	0.023
AR2 test (P-value)	0.148

*Notes: Robust standard errors are in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.*

4.4. Robustness tests

4.4.1. Subsample Analysis

To ensure the robustness of the baseline findings, subsample analysis is conducted by categorizing the dataset into GCC countries (e.g., Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, UAE) and non-GCC Arab countries (e.g., Algeria, Comoros, Djibouti, Egypt, Iraq, Jordan, Lebanon, Libya, Mauritania, Morocco, Palestine, Somalia, Sudan, Syria, Tunisia, and Yemen). This approach examines whether the impact of COVID-19 on the number of bank borrowers differs between these groups, given their distinct economic structures and pandemic responses. GCC countries, characterized by oil-dependent economies, high fiscal capacities, and strong government support during the pandemic, are expected to exhibit a less pronounced negative impact of COVID-19 on borrowing behavior. In contrast, non-GCC countries, with more diversified economies and limited fiscal resources, may display a stronger adverse effect on the number of bank borrowers.

As shown in Table 5, the results confirm the hypothesized differences. For GCC countries, the negative coefficient of COVID-19 is significant but smaller in magnitude compared to non-GCC countries. This suggests that the financial resilience and policy interventions in GCC economies mitigated some of the adverse effects of the pandemic on banking dynamics. Conversely, non-GCC countries experienced a more pronounced decline in bank borrowers, highlighting their greater vulnerability to the economic disruptions caused by COVID-19. These findings underscore the importance of considering regional economic characteristics when analyzing the impact of global crises on banking behavior. The divergence in effects between GCC and non-GCC countries further strengthens the robustness of the study's conclusions.

Table 5. Subsample Analysis Results – GCC vs. Non-GCC Countries (Two-Step System GMM).

Variables	GCC Countries	Non-GCC Countries
Lag Bank Borrowers t-1	-0.105**	-0.245**
	(0.052)	(0.083)
COVID-19	-0.978**	-2.104***
	(0.426)	(0.558)
GDP	0.089**	0.028
	(0.037)	(0.022)
Exchange Rate	-0.042**	-0.078***
	(0.014)	(0.009)
Unemployment Rate	-0.004	-0.011
	(0.018)	(0.019)
Constant	4.861***	5.604***
	(0.332)	(0.274)
Hansen Test (P-value)	0.412	0.287
AR1 Test (P-value)	0.037	0.019
AR2 Test (P-value)	0.189	0.143

*Notes: Robust standard errors are in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.*

4.4.2. Alternative Econometric Models: Use Pooled OLS, fixed effects, random effects, 2sls

To ensure the robustness of the baseline findings, alternative econometric models—pooled OLS, fixed effects (FE), random effects (RE), and two-stage least squares (2SLS)—are employed. The Pooled OLS model serves as a basic benchmark, assuming homogeneity across countries without accounting for country-specific effects. Although it provides initial insights, it does not control for unobserved heterogeneity, which could lead to biased results. To address this, the fixed effects (FE) model is used, which controls for time-invariant unobserved heterogeneity by incorporating country-specific effects. This method isolates within-country variations and provides more accurate estimates of the relationship between COVID-19 and bank borrowers. In contrast, the random effects (RE) model assumes unobserved heterogeneity is random and uncorrelated with the independent variables. The choice between FE and RE is guided by the Hausman test, with the RE model being more efficient if its assumptions hold. To address potential endogeneity issues, the 2SLS model is employed, using instruments like lagged COVID-19 cases

or specific pandemic responses to mitigate concerns such as reverse causality or omitted variable bias.

The results from these models, summarized in Table 6, consistently show a significant negative effect of COVID-19 on the number of bank borrowers, reinforcing the robustness of the baseline findings. Although the coefficients vary slightly across models, the negative relationship remains stable across the different specifications, confirming the reliability of the results. The FE model shows slightly larger coefficients, highlighting the importance of within-country dynamics, while the 2SLS model strengthens the causal interpretation of the findings, addressing endogeneity concerns effectively.

Table 6. Results using different econometric models (Pooled OLS, Fixed Effects, Random Effects, and 2SLS).

Variables	Pooled OLS	Fixed Effects	Random Effects	2SLS
Lag Bank Borrowers t-1	-0.178**	-0.181**	-0.175**	-0.179**
	(0.069)	(0.070)	(0.073)	(0.070)
COVID-19	-1.542***	-1.568***	-1.530***	-1.550***
	(0.464)	(0.468)	(0.470)	(0.462)
GDP	0.045**	0.046**	0.044**	0.045**
	(0.018)	(0.019)	(0.019)	(0.018)
Exchange Rate	-0.063***	-0.062***	-0.064***	-0.063***
	(0.006)	(0.006)	(0.006)	(0.006)
Unemployment Rate	-0.007	-0.008	-0.006	-0.007
	(0.015)	(0.015)	(0.015)	(0.015)
Constant	5.232***	5.198***	5.246***	5.223***
	(0.212)	(0.210)	(0.214)	(0.213)
Observations	110	110	110	110
R-Squared	0.382	0.410	0.390	0.377
P-value of F-statistic	0.000	0.000	0.000	0.000

*Notes: Robust standard errors are in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.*

5. Conclusion

This study examines the correlation between COVID-19 and bank borrowers across Arab economies from 2017 to 2022. Spanning six years and utilizing a panel dataset of 22 Arab nations, the analysis employs the two-step system GMM estimator to investigate this relationship in depth. This research represents a significant advancement, being the first to explore the impact of COVID-19 on bank borrowers within the Arab region, thereby establishing a pioneering milestone in this critical area of inquiry. The comprehensive nature of the dataset and the innovative analytical approach significantly enhance the existing body of knowledge, providing valuable insights into how this global crisis has influenced borrowing dynamics within the region's banking landscape.

The study's findings reveal a significant and notably negative effect of the COVID-19 coefficient on the number of bank borrowers in Arab economies, indicating a substantial decline in borrowers due to pandemic-related impacts. This outcome underscores the direct influence of the pandemic on banking activities, highlighting how external economic factors can shape and diminish borrower engagement within these financial systems. Robustness tests, including subsample analysis (GCC vs. non-GCC countries) and alternative econometric models (Pooled OLS, Fixed Effects, Random Effects, and 2SLS), consistently support these results. Specifically, the negative impact of COVID-19 on borrowing was observed across different subgroups, with a more pronounced decline in non-GCC countries, suggesting that economic structures and pandemic responses influenced borrowing dynamics. The alternative models further confirm the robustness of the COVID-19 effect, reinforcing the credibility of the findings.

The results of this study carry significant policy implications for Arab economies, particularly in light of the pronounced impact of COVID-19 on the reduction of bank borrowers. COVID-19 has led to a significant decline in

borrowing activity across Arab economies, highlighting the need for urgent and targeted policy interventions during times of crisis. Policymakers should prioritize stabilizing the financial system by implementing measures to reduce borrowing costs and improve liquidity in the banking sector. These efforts will help ensure that individuals and businesses can access credit despite the economic challenges brought on by the pandemic. Additionally, controlling exchange rate fluctuations is crucial, as volatility in currency markets can increase borrowing costs and discourage credit demand. By focusing on these key areas, policymakers can mitigate the negative impacts of the pandemic on borrowing behavior. Moreover, supporting economic recovery through investments in infrastructure, job creation, and other growth-driven initiatives will naturally stimulate demand for credit. These targeted interventions will not only strengthen the banking sector's resilience but also promote long-term recovery and stability in the economy.

Future research should extend analyses beyond 2022 to explore the ongoing effects of external shocks like COVID-19 on borrowing in Arab economies. Examining sector-specific borrowing patterns, incorporating qualitative assessments, and conducting comparative studies will offer deeper insights into borrower behavior and regional policy approaches. Evaluating the impact of interventions such as loan moratoriums and exploring the role of financial technology in shaping borrowing trends will be key. Understanding how economic shocks influence risk assessments will help design a more resilient financial system and inform targeted policy responses.

Funding Statement

This research received no external funding.

Acknowledgments

Acknowledgments to anonymous referees' comments and editor's effort.

Conflict of interest

All the authors claim that the manuscript is completely original. The authors also declare no conflict of interest.

Author contributions

The author was solely responsible for all aspects of the research, including conceptualization, data curation, formal analysis, funding acquisition, investigation, methodology, project administration, resources, software, supervision, validation, visualization, writing – original draft, and writing – review & editing.

References

Aizenman, J., Jinjarak, Y., and Spiegel, M. M. (2023). Fiscal capacity and commercial bank lending under COVID-19. *Journal of the Japanese and International Economies*, 68, 101261. https://www.nber.org/papers/w29882

Aliani, K., Al-kayed, L., and Boujlil, R. (2022). COVID-19 effect on Islamic vs. conventional banks' stock prices: Case of GCC countries. *The Journal of Economic Asymmetries*, 26, e00263. https://doi.org/10.1016/j.jeca.2022.e00263

Amiri, H., Aminizadeh, M., Rezapour, M., Tavan, A., and Aminizadeh, M. (2023). The impact of Covid 19 pandemic on life satisfaction and health of Iranian bank employees. *Heliyon*, 9(9). https://doi.org/10.1016/j.heliyon.2023.e19088

Anani, M., and Owusu, F. (2023). Regulatory capital and bank risk-resilience amid the Covid-19 pandemic: How are the Basel reforms faring?. *Finance Research Letters*, 52, 103591. https://doi.org/10.1016/j.frl.2022.103591

Bond, S. R. (2002). Dynamic panel data models: a guide to micro data methods and practice. *Portuguese economic journal*, 1, 141-162. https://doi.org/10.1007/s10258-002-0009-9

Boubakri, N., Mirzaei, A., and Saad, M. (2023). Bank lending during the COVID-19 pandemic: A comparison of Islamic and conventional banks. *Journal of International Financial Markets, Institutions and Money*, 84, 101743. https://doi.org/10.1016/j.intfin.2023.101743

Çolak, G., and Öztekin, Ö. (2021). The impact of COVID-19 pandemic on bank lending around the world. *Journal of Banking & Finance*, 133, 106207. https://doi.org/10.1016/j.jbankfin.2021.106207

Degryse, H., and Huylebroek, C. (2023). Fiscal support and banks' loan loss provisions during the COVID-19 crisis. *Journal of Financial Stability*, 101150. https://doi.org/10.1016/j.jfs.2023.101150

Dursun-de Neef, H. Ö., and Schandlbauer, A. (2021). COVID-19 and lending responses of European banks. *Journal of Banking & Finance*, 133, 106236. https://doi.org/10.1016/j.jbankfin.2021.106236

Dursun-de Neef, H. Ö., and Schandlbauer, A. (2022). COVID-19, bank deposits, and lending. *Journal of Empirical Finance*, 68, 20-33. https://doi.org/10.1016/j.jempfin.2022.05.003

Fang, J., Collins, A., and Yao, S. (2021). On the global COVID-19 pandemic and China's FDI. *Journal of Asian Economics*, 74, 101300 https://doi.org/10.1016/j.asieco.2021.101300

Fu, Y., Alleyne, A., and Mu, Y. (2021). Does lockdown bring shutdown? impact of the covid-19 pandemic on foreign direct investment. *Emerg Mark Financ Trade*. https://doi.org/10.1080/1540496X.2020.1865150

Gao, H., Li, J., and Wen, H. (2023). Bank funding costs during the COVID-19 pandemic: Evidence from China. *Pacific-Basin Finance Journal*, 79, 102006. https://doi.org/10.1016/j.pacfin.2023.102006

Giofré, M. (2021). COVID-19 stringency measures and foreign investment: an early assessment. *North American Journal of Economics and Finance*, 58, 101536. https://doi.org/10.1016/j.najef.2021.101536

Gulati, R., Charles, V., Hassan, M. K., and Kumar, S. (2023). COVID-19 crisis and the efficiency of Indian banks: Have they weathered the storm?. *Socio-Economic Planning Sciences*, 88, 101661. https://doi.org/10.1016/j.seps.2023.101661

Guo, W. C., and Tseng, P. L. (2023). COVID-19, bank risk, and capital regulation: The aggregate shock and social distancing. *The Quarterly Review of Economics and Finance*, 92, 155-173. https://doi.org/10.1016/j.qref.2023.09.004

Hayakawa, K., and Mukunoki, H. (2021). The impact of COVID-19 on international trade: Evidence from the first shock. *Journal of the Japanese and International Economies*, 60, 101135. https://doi.org/10.1016/j.jjie.2021.101135

Ho, L. T., and Gan, C. (2021). Foreign direct investment and world pandemic uncertainty index: do health pandemics matter? *Journal of Risk and Financial Management*, 14(107), 1–15. https://doi.org/10.3390/jrfm14030107

Kotcharin, S., Maneenop, S., and Jaroenjitrkam, A. (2023). The impact of government policy responses on airline stock return during the COVID-19 crisis. *Research in Transportation Economics*, 99, 101298. https://doi.org/10.1016/j.retrec.2023.101298

Mena, C., Karatzas, A., and Hansen, C. (2022). International trade resilience and the Covid-19 pandemic. *Journal of Business Research*, 138, 77-91. https://doi.org/10.1016/j.jbusres.2021.08.064

Nawoi, L., and Nijangan, H. (2021). The effect of covid-19 outbreak on foreign direct investment: Do sovereign wealth funds matter? *Transnational Corporations Review*. https://doi.org/10.1080/19186444.2021.1964313

Nitsch, V. (2022). Covid-19 and international trade: Evidence from New Zealand. *Economics Letters*, 217, 110627. https://doi.org/10.1016/j.econlet.2022.110627

Park, C. Y., and Shin, K. (2021). COVID-19, nonperforming loans, and cross-border bank lending. *Journal of Banking & Finance*, 133, 106233. https://doi.org/10.1016/j.jbankfin.2021.106233

Saif-Alyousfi, A. Y. (2025a). Energy shocks and stock market returns under COVID-19: New insights from the United States. 134546.. *Energy*, *134546*. https://doi.org/10.1016/j.energy.2025.134546

Saif-Alyousfi, A. Y. (2025b). The impact of COVID-19 on foreign direct investment in Arab economies. *Journal of Islamic Accounting and Business Research*. https://doi.org/10.1108/JIABR-02-2024-0057

Saif-Alyousfi, A. Y. (2024). COVID-19 and SMEs deposits with commercial banks: evidence from African economies. *Financial Economics Letters*, *2*(3), 37-50. https://doi.org/10.58567/fel03010006

Saif-Alyousfi, A. Y. (2021). FDI inflows and bank deposits: evidence from 18 MENA economies. *Competitiveness Review: An International Business Journal*, 32(6), 880-914. https://doi.org/10.1108/CR-05-2020-0078

Saif-Alyousfi, A. Y. (2022). Determinants of bank profitability: evidence from 47 Asian countries. *Journal of Economic Studies*, 49(1), 44-60. https://doi.org/10.1108/JES-05-2020-0215

Saif-Alyousfi, A. Y. (2022). The impact of COVID-19 and the stringency of government policy responses on stock market returns worldwide. *Journal of Chinese Economic and Foreign Trade Studies*, 15(1), 87-105. https://doi.org/10.1108/JCEFTS-07-2021-0030

Saif-Alyousfi, A. Y. (2023). Impact of FDI inflows on bank loans in Gulf Cooperation Council economies: an empirical insight. *International Journal of Emerging Markets*, 18(2), 505-524. https://doi.org/10.1108/IJOEM-06-2019-

0465
Saif-Alyousfi, A. Y., and Saha, A. (2021). Do tourism receipts affect bank profitability? Analytical evidence from 85 tourism economies. *Research in International Business and Finance*, 58, 101437. https://doi.org/10.1016/j.ribaf.2021.101437
Saif-Alyousfi, A. Y., and Saha, A. (2021b). Determinants of banks' risk-taking behavior, stability and profitability: Evidence from GCC countries. *International Journal of Islamic and Middle Eastern Finance and Management*, 14(5), 874-907. https://doi.org/10.1108/IMEFM-03-2019-0129
Saif-Alyousfi, A. Y., and Saha, A. (2021c). The impact of COVID-19 and non-pharmaceutical interventions on energy returns worldwide. *Sustainable Cities and Society*, 70, 102943. https://doi.org/10.1016/j.scs.2021.102943
Saif-Alyousfi, A. Y., Saha, A., and Alshammari, T. R. (2023). Bank diversification and ESG activities: A global perspective. *Economic Systems*, 101094. https://doi.org/10.1016/j.ecosys.2023.101094
Saif-Alyousfi, A. Y., Saha, A., and Md-Rus, R. (2020). The impact of bank competition and concentration on bank risk-taking behavior and stability: Evidence from GCC countries. *The North American Journal of Economics and Finance*, 51, 100867. https://doi.org/10.1016/j.najef.2018.10.015
Saif-Alyousfi, A. Y., Saha, A., Md-Rus, R., and Taufil-Mohd, K. N. (2021a). Do oil and gas price shocks have an impact on bank performance?. *Journal of Commodity Markets*, 22, 100147. https://doi.org/10.1016/j.jcomm.2020.100147
Silva, T. C., De Souza, S. R. S., Guerra, S. M., and Tabak, B. M. (2023). COVID-19 and bank branch lending: The moderating effect of digitalization. *Journal of Banking & Finance*, 152, 106869. https://doi.org/10.1016/j.jbankfin.2023.106869
Susamto, A. A., Octavio, D. Q., Risfandy, T., and Wardani, D. T. K. (2023). Public ownership and local bank lending at the time of the Covid-19 pandemic: Evidence from Indonesia. *Pacific-Basin Finance Journal*, 102072. https://doi.org/10.1016/j.pacfin.2023.102072
Tran, D. V., Bui, D. G., Nguyen, C., and Hoang, H. V. (2023). Bank liquidity hoarding during the COVID-19 pandemic. *Finance Research Letters*, 55, 104021. https://doi.org/10.1016/j.frl.2023.104021
Windmeijer, F. (2005). A finite sample correction for the variance of linear efficient two-step GMM estimators. *Journal of econometrics*, *126*(1), 25-51. https://doi.org/10.1016/j.jeconom.2004.02.005
Zhao, J., Cao, J., and Huang, J. (2023). CEO/board medical background and stock returns during the COVID-19 pandemic. *Economic Modelling*, 127, 106469. https://doi.org/10.1016/j.econmod.2023.106469