



Liquidity, Exchange-Rate Issues, and Challenges Affecting the Future of Yemeni Banks: A Quantitative Analysis

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Keywords

1. Liquidity issues,
2. Exchange rate volatility,
3. Solvency,
4. Future of banks,
5. Foreign exchange reserves,
6. Yemeni banks.

Abstract:

The banking sector in Yemen has suffered widespread disruptions triggered by the prolonged ongoing conflict. Among such disruptions are liquidity shortages and exchange rate instability, leading to operational inefficiencies and heightened financial instability. This study aims to examine the effects of liquidity constraints and currency volatility on the financial performance and systemic stability of Yemeni banks. For the purposes of the study, data were collected through a structured cross-sectional survey administered to professionals at ten commercial banks in Yemen. 69 valid responses were obtained and analyzed.

The study employs descriptive statistics, correlation analysis, and multiple regression modeling to investigate the relationships between liquidity issues, exchange rate fluctuations, and key banking functions. Results indicate that both liquidity shortages and exchange rate volatility significantly impair banking operations, weaken solvency, and increase exposure to systemic risks. However, the complexity of monetary policy and institutional fragmentation further undermines resilience.

The study underscores the importance of targeted financial reforms and enhanced regulatory capacity. While the findings provide context-specific insights into the fragile banking environment in Yemen, further research using broader macroeconomic data is recommended to support generalization and long-term policy development.

السيولة وقضايا اسعار الصرف والتحديات المؤثرة على مستقبل البنوك اليمنية: تحليل كمي

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الكلمات المفتاحية

1. مشاكل السيولة،
2. تقلبات أسعار الصرف،
3. الملاءة المالية،
4. مستقبل البنوك،
5. احتياطات النقد الأجنبي،
6. البنوك اليمنية

الملخص:

شهد القطاع المصرفي في اليمن اضطرابات عميقة نتيجة الصراع المطول في البلاد، حيث أسهمت أزمة السيولة الحادة وتقلبات أسعار الصرف في تقويض الاستقرار المالي والكفاءة التشغيلية للمؤسسات المصرفية. تهدف هذه الدراسة إلى تحليل تأثير قيود السيولة وتذبذب العملة على الأداء المالي والاستقرار النظامي للبنوك اليمنية. وقد استخدمت منهجية المسح المقطعي، من خلال توزيع استبيان منظم على مجموعة من المتخصصين في عشرة بنوك تجارية عاملة في اليمن، وأسفر ذلك عن جمع وتحليل 69 استجابة صالحة. اعتدت الدراسة على مزيج من الأساليب الإحصائية شملت الإحصاء الوصفي، وتحليل الارتباط، ونمذجة الانحدار المتعدد، وذلك لاستكشاف العلاقة بين أزمات السيولة وتقلبات سعر الصرف من جهة، وبين الوظائف المصرفية الأساسية من جهة أخرى. أظهرت النتائج أن كلاً من نقص السيولة والتقلبات الحادة في سعر الصرف يؤثران سلباً على العمليات المصرفية، ويضعفان من ملاءة البنوك، ويزيدان من تعرضها للمخاطر النظامية. كما أظهرت النتائج أن هشاشة الإطار المؤسسي وتعقيد السياسة النقدية يحذان من قدرة النظام المصرفي على التكيف مع الأزمات.

تؤكد الدراسة على الحاجة الملحة إلى تنفيذ إصلاحات مالية مستهدفة، إلى جانب تعزيز القدرات التنظيمية والرقابية للبنك المركزي والمؤسسات المعنية. وعلى الرغم من أن نتائج الدراسة تقدم رؤى قيّمة تستند إلى السياق المحلي للقطاع المصرفي اليمني، فإنها توصي بإجراء المزيد من الأبحاث باستخدام بيانات اقتصادية كلية شاملة، بهدف دعم تعميم النتائج وتوجيه صناعات السياسات نحو تطوير حلول استراتيجية طويلة الأجل.

Introduction:

Banks are fundamental institutions in any economy, facilitating the flow of capital, providing credit to households and businesses, and helping maintain financial stability (Collins and Gallagher, 2016). In Yemen, however, the banking sector has experienced serious disruptions due to ongoing conflicts, leading to severe liquidity shortages, instability in foreign exchange rates, and rising financial transaction costs (Raga et al., 2021). As one of the poorest countries in the Middle East and North Africa (MENA) region, Yemen is grappling with an ongoing crisis that has intensified the financial strain on the banking system across the country. Traditionally, banks serve as intermediaries for capital circulation and credit provision, but they are now struggling to maintain operations amid economic turmoil (Boyarchenko and Mueller, 2019). The depreciation of the Yemeni currency and diminishing foreign exchange reserves further complicate the sector's ability to meet corporations' financial needs (Al-Edreesi and Al-Gaphari, 2024; Al-Rashidi and Al-Afandi, 2024).

The destabilization of banks in Yemen has profound implications both for the financial system and broader economy of the country. Financial institutions are critical to economic recovery in conflict-affected states, as they facilitate monetary transactions, allocate credit, and sustain capital circulation (Viterbo, 2018). These essential functions are greatly frustrated in Yemen as a result of the growing liquidity constraints and foreign exchange volatility, which threatens the country's prospects for financial and economic stability (Mosko and Bozdo, 2015). Addressing these challenges should therefore be a priority to ensure the survival and effectiveness of banking institutions.

Previous research has acknowledged the role of banks in economic development as well as the broader impact of conflict on financial systems (Viswanadham, 2016; Viterbo, 2018). Studies have shown that liquidity shortages and currency instability can significantly impair banking operations, reduce investor confidence, limit credit access, and hinder

economic recovery. Research on banking crises in conflict-affected economies highlights the risks associated with prolonged instability, particularly challenges in regard to maintaining liquidity and exchange rate stability in fragile financial systems.

Despite the existing literature on banking crises and financial instability, significant gaps still remain in the literature. First, most prior research has focused on stable economies, often neglecting quantitative analysis of how liquidity crises and currency instability specifically impair banking operations in conflict-affected contexts, such as Yemen (Novelli, 2016). Second, studies relying on third-party datasets often overlook the operational realities of smaller Yemeni banks, and qualitative approaches lack the empirical rigor necessary to link financial stressors with institutional viability (Shawtari et al., 2015). A comprehensive quantitative analysis is thus required to provide deeper insights into these challenges.

Building on the identified gaps, this study conducts a nuanced quantitative analysis focusing specifically on how liquidity shortages and exchange rate volatility are compounding the operational challenges facing Yemeni banks. By examining financial trends, banking operations, and macroeconomic influences, this study provides valuable data-driven insights that can help inform policymakers, financial institutions, and economic recovery efforts in Yemen.

A quantitative approach was employed to analyze the key factors contributing to liquidity and exchange rate challenges in Yemeni banks using a quantitative approach. Towards this end, the study aims to assess the extent to which the financial instability in the banking sector has reached and its implications for banking operations, credit access, and economic sustainability. The study also suggests some policy recommendations that can, hopefully, help improve banking resilience in conflict-affected environments.

Based on the above overview of the challenges facing the banking sector in terms of liquidity shortage and exchange rate instability,

as well as the identified research gap, the following research questions are raised, the questions that can serve to further define the core financial issues affecting Yemeni banks and to guide the research process.

RQ1. How do liquidity shortages and exchange rate volatility directly impact operational stability and systemic risks within Yemeni banks, particularly in the context of ongoing conflict and economic instability?

RQ2. How do these financial challenges affect Yemeni banking sector's core functions of financial intermediation, credit provision, and support for economic recovery in a conflict-affected environment?

Literature Review

The Role of Banks in Economic Development

Banks play a fundamental role in economic development by facilitating financial intermediation, mobilizing savings, and allocating capital to productive sectors (Rahman et al., 2018). These functions drive economic growth, innovation and entrepreneurship (Akinwale et al., 2020; Bukowski and Kraczkowski, 2021). Financial intermediation enhances capital allocation, boosts investment, and accelerates economic progress (Ibhagui, 2020), whereas credit creation fuels business expansion, employment, and poverty reduction (Sant'Anna et al., 2021; Shepherd et al., 2021). Central banks regulate their monetary policies to maintain macroeconomic stability through interest rate adjustments and reserve requirements (Afanasyeva and Korovin, 2020; Khan and Khan, 2023). Additionally, banks support risk management, facilitate international trade, and attract foreign investment, making a stable banking sector crucial for economic development, thus making a stable banking sector crucial for economic development (Venables, 2015).

Financial Challenges Faced by Banks in Conflict Zones

Banks in conflict-affected regions often face serious challenges, such as political instability, security risks, and regulatory uncertainties that

disrupt financial markets, lead to capital flights, and diminish lending activities (Umar et al., 2022). Non-performing loans (NPLs) increase due to business closures and defaults (Taiwo and Mike, 2021), while liquidity constraints arise from depositor withdrawals and capital outflows (Özel et al., 2021; Viterbo, 2018). Exchange rate volatility exacerbates financial instability by increasing foreign debt service costs and discouraging investment (Gallimberti, 2021; Okechukwu et al., 2019). Compliance with international financial regulations further increases operational costs and restricts cross-border transactions (Levi and Soudijn, 2020; Logan, 2016). Despite these challenges, banks in conflict zones play a critical role in economic stability and reconstruction through strategies such as microfinance and digital banking (Arora, 2024; Scott et al., 2024).

Impact of Liquidity Shortages on Banking Operations

Liquidity shortages threaten banking stability and economic growth by limiting banks' ability to meet short-term obligations, provide credit, and maintain depositor confidence (Kim et al., 2022). External financial shocks, including economic recessions and political instability, can trigger liquidity constraints (Kahn and Wagner, 2021), leading to deposit withdrawals and credit restrictions (Vasilyeva and Novopashina, 2018). High borrowing costs further reduce business and consumer access to credit (Tsuruta, 2023). Central banks intervene through open market operations and emergency lending to stabilize liquidity, and excessive reliance on these measures can create moral hazards (Bulusu, 2020; Krušković, 2022; Toporowski, 2022). Effective regulatory frameworks and risk-management strategies are essential for mitigating liquidity shortages (Li and Li, 2016).

Exchange Rate Instability and Its Effects on Financial Institutions

Exchange rate fluctuations create financial instability by affecting the value of assets and liabilities, and by denominating the foreign currency (Ledenyov and Ledenyov, 2015). Currency volatility impacts trade financing, discourages investment, and reduces banks'

revenues from international transactions (Huang, 2017; Oriaku and Oriaku, 2016). Sharp fluctuations increase borrowing costs, limit credit availability, and affect lending behavior (Gurara et al., 2020). Banks employ hedging strategies, such as currency swaps, to mitigate risks (Bejol and Livingstone, 2018), while central banks implement monetary policies to stabilize exchange rates (Akdogan, 2020). Therefore, strengthening financial regulations is necessary to protect banks from exchange-rate instability.

Gaps in Existing Literature.

Despite extensive research on banks' roles in economic development and their challenges in conflict zones, some gaps in the literature still persist. This is particularly evident in Yemen's banking sector, where liquidity management, currency instability, and broader economic conditions present unique challenges for financial institutions. This section identifies the key gaps in the literature and highlights areas for future research.

Liquidity Management in Conflict Zones. While liquidity management in banks has been widely studied, particularly in stable economies (Ahmad Abu-Alrop, 2019), few studies have focused on the distinct liquidity challenges that banks face in conflict zones. In Yemen, liquidity crises are exacerbated by weak financial institutions, and reliance on reserves for government expenditures, and local currency scarcity (Shawtari et al., 2015). Al-Muslimi (2019) highlights the forced drawdown of reserves, which further limits the operational capacity of commercial banks. The existing literature lacks detailed studies on how liquidity shortages may affect credit extension, financial stability, and the banking sector's role in economic recovery in conflict-affected regions.

Currency Instability and the Role of Multiple Local Banknotes. Another critical gap concerns the existence of multiple local banknotes and the resulting exchange rate disparities in the conflict zones. In Yemen, for instance, the central bank's monetary policies have led to two types of banknotes with distinct exchange rates, creating uncertainty and risk

for banks (Youness, 2022). The existing literature, to my knowledge, has not sufficiently studied how this dual-currency system may impact public trust, the effectiveness of monetary policy, and the stability of financial institutions. Further research is required to examine the long-term effects of currency instability on the strategic and operational decisions of banks.

Exchange Rate Volatility and Banking Operations. While exchange rate volatility has been widely analyzed in developed economies, there is still limited research on its impact in conflict zones, where regional exchange rate disparities can exceed 30%. The widening gap between exchange rates in regions such as Sana'a and Aden complicates cross-border transactions, trade financing, and bank profitability, especially for institutions that deal within foreign currency (Ghosh et al., 2018). Existing studies do not sufficiently address how extreme exchange rate disparities influence financial stability, lending practices, or local economic support. Further research is therefore required to better understand how banks manage these challenges and to develop solutions to mitigate exchange rate risks in conflict-affected environments.

Regional Disparities and Financial Inclusion. Financial inclusion has received global attention (Nisha et al., 2020), but little research has examined how regional disparities in banking access may intensify financial challenges in conflict zones. In Yemen, a large portion of the population, particularly in rural areas, remains unbanked, which restricts economic development and financial stability. Additionally, the dual exchange rate system and declining trust in banks further limits financial access and prevents economic participation. Research exploring the relationship between financial inclusion, regional disparities, and banking challenges is necessary to assess their combined impact on economic development and sector sustainability.

Methods

This study adopts a quantitative approach to the analysis of the factors influencing Yemeni

banks, primarily focusing on liquidity shortages, exchange rate volatility, and related challenges. A cross-sectional survey was conducted using paper-based questionnaires to collect primary data, providing a detailed overview of participants' characteristics, attitudes, and behaviors (Walliman, 2021; Watson, 2015). A careful design is crucial to enhance response rates and accuracy, including clear formatting, appropriate question sequencing, and validated scales (Hendra and Hill, 2019). Although paper surveys have limitations, including potential bias and an inability to capture changes over time (Fitzgerald et al., 2019), they remain effective when customized to the target population and research objectives. Combining these methods with other approaches can enhance the richness of data (Asiamah et al., 2017).

Data collection involved selecting ten commercial banks based on criteria set by Yemen Central Bank, including asset size, geographic coverage, and market share in key financial activities. These banks were chosen to represent systemically important institutions that influence liquidity and foreign exchanges. A purposive sample of 120 professionals was selected, comprising 80 senior managers responsible for liquidity and foreign exchange decisions and 40 mid-level operational staff who address frontline challenges. HR coordinators administered hard copies of the questionnaire form in person, particularly in non-conflict zones with limited digital infrastructure.

The volatility assessment showed strong reliability, with a Cronbach's alpha of 0.966, indicating excellent internal consistency. This confirms that the assessment items are closely related and accurately measure the intended construct.

Materials

This study uses a variety of financial and economic materials to assess the challenges facing Yemen's banking sector, particularly with respect to liquidity shortages and exchange rate instability. Financial statements from Yemeni banks highlight severe liquidity shortages, rising non-performing loans (NPLs), and declining solvency due to depleted foreign

exchange reserves and capital flights. World Bank reports further illustrate the deterioration of the sector, with restricted lending and financial instability. Additionally, exchange rate data from the Central Bank of Yemen reveal extreme currency fluctuations that adversely affect trade and investment.

Yemen's banking sector is currently experiencing an unprecedented liquidity crisis exacerbated by the impaired ability of the Central Bank to perform its core functions. The division of the Central Bank between Sana'a and Aden has led to inconsistent monetary policies, severely undermining the financial system's stability. Additionally, weak banking sector solvency remains a pressing issue, with high levels of NPLs reducing banks' capital reserves and limiting their credit provision ability. Microfinance institutions have been particularly affected as rising loan defaults have constrained their ability to support small businesses and low-income borrowers. Severe restrictions on correspondent banking relationships have further isolated Yemeni banks from the global financial system, complicating cross-border transactions and remittance processing. Finally, weak financial intermediation capacity has led to inefficient capital allocation, preventing businesses—especially small and medium enterprises (SMEs)—from accessing necessary funding, thereby exacerbating economic stagnation and rising unemployment (Engelke, 2017; World Bank Group, 2017).

These financial constraints have rendered Yemen's banking sector fragile, significantly hindering economic recovery and financial stability. Also, the ongoing conflict, combined with currency depreciation, banking fragmentation, and liquidity shortages, has created an urgent need for financial reforms and external support to restore stability in the sector. Without addressing these challenges, the ability of Yemeni banks to facilitate investment, provide credit, and support economic growth will remain severely limited.

Survey Instrument Development.

The survey instrument was developed using a 22-item Likert-scale questionnaire (ranging from 1 = Strongly Disagree to 5 = Strongly

Agree) adapted from validated instruments used in liquidity risk and exchange rate studies (Ben-Ahmed et al., 2023; Tunc et al., 2020). The questionnaire was designed to assess key dimensions relevant to the Yemeni banking sector, including liquidity shortages (e.g., reserve depletion, withdrawal consequences), exchange rate volatility (e.g., dual-currency disparities, foreign currency demand), and Table 1. Previous studies on factor analysis items.

challenges (e.g., solvency and intermediation capacity). To enhance contextual relevance, modifications were made to align with Yemen’s financial environment. Detailed construct definitions, such as “liquidity shortages, exchange rate volatility, and challenges” measured using eight survey items, are presented

Table 1. Previous studies on factor analysis items.

Construct	Definitions and literature evidence	Items
Liquidity Shortages	Liquidity shortages can cause solvency crises, restricted lending, and economic stagnation, especially during financial instability (Čehajić and Košak, 2022; Dong and Wen, 2023).	1
Reserve Depletion	Reserve depletion, caused by withdrawals, economic pressures, or shocks, can lead to liquidity shortages, bank runs, and instability, especially in fragile economies (Gaggero et al., 2015; Sharma, 2022).	2
Central Bank Liquidity Constraints	Central bank liquidity constraints, due to low reserves, capital flight, or fiscal instability, can worsen financial crises, weaken monetary policy, and lead to exchange rate volatility and banking distress (Berger and Bouwman, 2017; Ha and Kang, 2015).	3
Withdrawal Consequences	Withdrawal consequences refer to the negative effects of large-scale customer withdrawals, causing liquidity shortages, asset liquidation, and bank runs, which can trigger financial instability (Girardi et al., 2021; Robatto, 2016).	4
Foreign Currency Demand	Foreign currency demand, driven by trade imbalances, capital outflows, or currency depreciation, can deplete reserves, destabilize exchange rates, and contribute to financial crises in emerging economies (Bruno and Shin, 2020; Plantin and Shin, 2018).	5
Banknote Policy Failure	Banknote policy failure occurs when central banks fail to manage currency issuance, leading to hyperinflation, devaluation, and loss of public confidence, which can worsen economic instability and undermine monetary policy (Chen, 2018; Efuntade and Efuntade, 2023).	6
Monetary Base Ineffectiveness	Monetary base ineffectiveness occurs when changes in the central bank’s money supply fail to control inflation or stimulate growth, especially during financial instability or low confidence (Matthews and Ong, 2022; Ninomiya, 2016).	8
Foreign Reserve Decline	Foreign reserve decline, caused by trade imbalances, capital flight, or market interventions, can lead to exchange rate volatility, financial crises, and difficulty meeting external obligations (Akdogan, 2020; Tunc et al., 2020).	2
Exchange Rate Instability	Exchange rate instability, caused by economic uncertainty, inflation, or speculation, can undermine investor confidence, disrupt trade, and contribute to financial crises in emerging economies (Olamide et al., 2022; Stosic et al., 2016).	3
Unprecedented Liquidity Crisis	An unprecedented liquidity crisis occurs when financial institutions face severe asset shortages, often due to economic shocks or loss of confidence, leading to insolvencies, market collapse, and economic downturns (Dow, 2023; World Bank Group, 2017)	1
Monetary Policy Complexity	Monetary policy complexity arises from economic uncertainty, multiple objectives, and global market interconnections, making policy less effective during instability or shocks (Aastveit et al., 2017; Burjack et al., 2019; World Bank Group, 2017)	3
Banking Sector Insolvency	Banking sector insolvency occurs when institutions cannot meet liabilities due to insufficient assets, often from poor management, leading to financial instability, loss of confidence, and a credit crunch (Buera and Nicolini, 2020; Edeh et al., 2022; World Bank Group, 2017)	4

Correspondent Banking Restrictions	Correspondent banking restrictions, often due to regulatory concerns or geopolitical tensions, can hinder trade, raise transaction costs, and reduce financial inclusion, especially in developing economies (Ghunaim, 2020; World Bank Group, 2017)	5
Financial Intermediation Weakness	Financial intermediation weakness, caused by poor risk management or inefficiencies, can hinder economic growth, limit credit access, and increase instability (Poghosyan, 2021; World Bank Group, 2017)	6

Statistical Analysis

Data analysis was conducted utilizing SPSS v23, adhering to a structured methodology to address the research questions. Initially, descriptive statistics were employed to summarize the participant demographics and response distributions (Table 2. Respondents' Profile and Frequency Distribution).

shows that correlation analysis was then applied to explore the relationships between liquidity constraints (e.g., reserve shortages), exchange rate variables (e.g., volatility severity), and challenges (e.g., unprecedented liquidity crisis) chosen for their relevance in analyzing continuous, normally distributed data. This analysis examined the direct impact of liquidity shortages, exchange rate volatility, and other challenges on the operational stability

Table 4.

Ethical Considerations. Informed consent was obtained from each of the participants through a written consent form in Arabic. The consent form explicitly delineated the study's purpose, potential risks, and assurances regarding participant anonymity. Participants were provided with copies of the questionnaire. To ensure data security, paper surveys were securely stored in locked cabinets and digital survey entries were protected by password access. These measures were implemented to safeguard participant information throughout the data collection and analysis phase. Furthermore, the research process was carefully designed in such a way that is respectful and considerate of participants' circumstances, ensuring their comfort and trust.

Results

Quantitative analysis reveals that liquidity shortages and exchange rate volatility are critical challenges affecting the future of banks in Yemen. The findings also indicate that these financial instabilities significantly impact banking operations, financial stability,

and systemic risks of Yemeni banks, particularly in the context of ongoing conflict and economic instability, as explored by Research Question 1 (RQ1). Regression analysis was subsequently conducted to examine the relationship between exchange rate volatility, liquidity shortages, and bank performance, controlling for factors specific to the Yemeni banking sector. This analysis aims to assess the impact of financial challenges on key banking functions, including financial intermediation, credit provision, and economic recovery support in a conflict-affected environment, as explored by Research Question 2 (RQ2)

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economic resilience, and modernization efforts. This research found that there is a complex interplay between macroeconomic factors and banking sector performance, which highlights the urgent need for comprehensive reforms to address these challenges.

Results of Respondents' Profile and Frequency Distribution. The demographic profile presented in indicates that the majority of respondents (55.07%) fell within the 30-40 age range, followed by those under 30 years (26.09%), 41-50 (13.04%), and above 50 years (5.80%). It also shows that males accounted for a higher proportion of the sample (66.67%), with females constituting 33.33%. As regards job roles, 71.01% were first-line managers, 20.29% middle managers, and 8.70% top managers. The educational attainment of respondents was primarily at the bachelor's degree level (73.91%), while 20.29% held master's degrees and 5.80% had diplomas. Regarding professional experience, 42.03% had over 10 years of work experience, 30.43% had 6-10 years, 20.29% had 2-5 years, and 7.25% had less than 2 years. In summary, the

sample comprises experienced, well-educated professionals, predominantly in managerial positions and of the male gender. Table 2.

Respondents' Profile and Frequency Distribution

Variable\Statistic	No. of categories	Categories	Frequency	(%)
Age	4	Less than 30	18.00	26.09
		30 - 40	38.00	55.07
		41- 50	9.00	13.04
		+50	4.00	5.80
Gender	2	Male	46.00	66.67
		Female	23.00	33.33
Job	3	First-line Manager	49.00	71.01
		Middle Manager	14.00	20.29
		Top Manager	6.00	8.70
Education level	3	Bachelor	51.00	73.91
		Diploma	4.00	5.80
		Master	14.00	20.29
Experience	4	Less than two years	5.00	7.25
		2 - 5 years	14.00	20.29
		6 - 10 years	21.00	30.43
		More than 10 years	29.00	42.03

Descriptive and correlation analysis of factors

As mentioned earlier, the study aimed to examine key financial factors influencing the Yemeni banking sector, with a focus on liquidity shortages and exchange rate instability. Descriptive and correlation analyses were employed to explore association between these variables, attempting to provide insights into challenges facing the banks in navigating financial instability. Additionally, the study assessed the impact of financial constraints on modernization efforts, including the adoption of digital banking services.

Key Trends Observed from the Data. The results presented in reveal that financial instability remains a significant challenge for Yemeni banks, with liquidity shortages and exchange rate fluctuations playing crucial roles in hindering banking operations. The data show a strong perception that financial instability directly contributes to operational difficulties, as indicated by the high agreement level in Item (7). However, Item (3) demonstrates that liquidity constraints have less impact on digital

banking expansion, suggesting that this constraint further complicates financial accessibility and modernization. Moreover, the introduction of new banknotes has failed to effectively resolve liquidity shortages, as evidenced by the strong positive correlation between this measure's failure and ongoing cash flow issues (Item 14). Additionally, the depreciation of the Yemeni Riyal was found to be a major factor destabilizing the banking sector, with Item (17) revealing that currency devaluation leads to increased demand for foreign currencies and reduced confidence in the local currency. Relationships Found Between Variables. The correlation analysis

confirms a strong association between liquidity constraints, exchange rate instability, and banking challenges. Liquidity shortages are positively correlated with banking instability, reinforcing the idea that cash flow issues contribute significantly to financial distress. Similarly, exchange rate fluctuations are also strongly correlated with banking instability,

with most respondents linking currency depreciation to deteriorating financial conditions. In certain cases, however, a weaker correlation was found between exchange rate volatility and banking stability. Item (22) suggests that, while most respondents view exchange rate instability as detrimental, some believe that fluctuations, under specific

Table 3 reflects that liquidity crises and non-performing loans are persistent issues that remain unresolved. The inability of new banknotes to resolve liquidity shortages points to a deeper structural issue within the sector, requiring policy interventions rather than a mere focus on currency availability. The mixed perspectives on exchange rate fluctuations further highlight the complexity of currency management in maintaining financial stability.

conditions, might provide financial adjustments that can benefit the banking sector. This mixed perception indicates that the impact of exchange rate fluctuations is context-dependent. *Broader Context and Implications.* The findings underline the urgent need for structural reforms in the Yemeni banking sector.

Although most respondents view depreciation as harmful, the potential for expansionary effects in certain circumstances suggests that exchange rate policies should be carefully tailored to the specific needs and conditions of the banking sector. Addressing these challenges calls for a combination of monetary policy reforms, regulatory improvements, and strategic interventions to bolster financial stability and resilience in the banking sector.

Table 3. Descriptive and Correlation Analysis of Factors

	Mean	SD	FYB	LI	ERI	ULC	DMPB	WSBS	SRCBR	WICFI
FYB	3.25	1.08								
LI	3.75	0.94	0.410**							
ERI	4.05	0.85	0.422**	0.933**						
ULC	3.97	0.52	0.424**	0.867**	0.966**					
DMPB	4.03	0.80	0.415**	0.947**	0.949**	0.919**				
WSBS	3.92	0.50	0.414**	0.936**	0.940**	0.897**	0.953**			
SRCBR	3.97	0.50	0.363**	0.850**	0.942**	0.910**	0.878**	0.906**		
WICFI	3.93	0.45	0.353**	0.832**	0.924**	0.883**	0.856**	0.871**	0.966**	

Note. **= Correlation is significant at the 0.01 level (2-tailed); * = Correlation is significant at the 0.05 level (2-tailed).

Regression analysis of factors

Multiple regression analysis was conducted to examine the hypothesized relationships between various financial challenges and their impact on the future stability of Yemeni banks. The analysis aimed to explore how certain factors such as liquidity constraints, exchange rate volatility, monetary policy implementation, solvency, corresponding banking relationships, and financial intermediation capacity affect banking performance and stability. This model helps identify the key financial determinants

influencing the stability of the banking sector in Yemen.

The regression model revealed several significant relationships between financial challenges and the stability of Yemeni banks. These factors include liquidity constraints, exchange rate fluctuations, solvency issues, monetary policy difficulties, and financial intermediation inefficiencies. The results underscore the urgent need for targeted policy interventions and financial management strategies to improve sectoral resilience.

Table 4 presents the regression coefficients and corresponding p-values, summarizing the key factors that influence banking stability and providing a comprehensive overview of the analysis.

The regression analysis revealed several significant findings with respect to the financial challenges encountered by Yemeni banks. Liquidity issues (LI) have a statistically significant positive effect on banking stability, emphasizing their crucial role in shaping the sector’s sustainability ($p = 0.000$). Exchange rate volatility (ERI) emerged as a major destabilizing factor with a substantial impact on banking performance. Fluctuations in currency values significantly affect the banking sector ($p = 0.000$). The unprecedented liquidity crisis (ULC) is another significant challenge affecting financial stability within Yemeni banks ($p = 0.000$). Additionally, Difficulty of monetary policy for banks (DMPB) emerged as a critical factor, suggesting the need for more flexible regulatory approaches ($p = 0.000$). Weakness of the Solvency of the Banking Sector (WSBS) in the banking sector is strongly associated with financial instability, highlighting the need for improved capital reserves ($p = 0.000$). Severe Restrictions in Correspondent Banks' Relationships (SRCBR) also significantly impacted financial transactions, further restricting economic integration and growth ($p < 0.002$). Finally, weak intermediation capacity of financial institutions (WICFI) negatively affects banking performance, underscoring the need for improving financial intermediation capacity to enhance resilience ($p < 0.003$).

Diagnostic tests were conducted to ensure the validity of the regression model. The variance inflation factor (VIF) values showed no significant multicollinearity between the independent variables. Additionally, heteroscedasticity was not detected using the Breusch-Pagan test, and residuals appeared to

follow a normal distribution. These checks confirm that the model assumptions were satisfied and that the results are reliable.

The regression analysis highlights several urgent areas of concern for the banking sector in Yemen. Given the significant role of liquidity constraints, improving liquidity management strategies is essential for enhancing the sector's stability. With exchange rate volatility being a major destabilizing factor, it is crucial to implement policies that stabilize the Yemeni Riyal and safeguard banking performance. The difficulties in implementing restrictive monetary policies point to the need for more adaptive regulatory frameworks to support banking operations and enhance financial resilience. The strong association between weak solvency and financial instability emphasizes the importance of improving capital reserves to reduce systemic risks. The restrictions on corresponding banking relationships highlight the need for policies that facilitate greater financial connectivity with global markets. Moreover, inefficiencies in financial intermediation represent a barrier to banking stability and performance, suggesting that improving intermediation capacity is essential for sectoral resilience.

It should be admitted that one limitation of this study is its reliance on secondary data, which may not fully capture the dynamic and complex challenges faced by Yemeni banks. Future research could explore primary data through interviews or case studies to offer a deeper understanding of the financial factors influencing banking stability. Additionally, exploring the impact of political instability and other external factors, which may not have been captured in this model, could offer a more comprehensive view. Future studies should also focus on developing targeted strategies to address liquidity crises and improve financial intermediation in Yemeni banks

Table 4. Comprehensive Regression Analysis Summary

Variables	R	R ²	Adj. R ²	F-statistic	B (Coeff.)	Beta (Std.)	t-statistic	p-value (Sig.)
Liquidity Issues	0.410	0.168	0.156	13.551	0.363	0.410	3.681	0.000

Exchange Rate Issues	0.422	0.178	0.165	14.479	0.421	0.422	3.805	0.000
ULC	0.424	0.179	0.167	14.646	0.406	0.424	3.827	0.000
DMPB	0.415	0.172	0.160	13.906	0.420	0.415	3.729	0.000
WSBS	0.414	0.171	0.159	13.827	0.416	0.414	3.718	0.000
SRCBR	0.363	0.132	0.119	10.160	0.407	0.363	3.187	0.002
WICFI	0.353	0.124	0.111	9.517	0.373	0.353	3.085	0.003

Discussion

This study examines the effects of liquidity shortages and exchange rate instability on Yemeni banks during conflicts, and reveals significant implications for banking operations and financial stability. The regression analysis underscores the critical impact of these challenges, with liquidity constraints ($\beta = 0.363, p = 0.000$) and exchange rate volatility ($\beta = 0.421, p = 0.000$) emerging as the primary destabilizing factors. The interplay between these financial constraints exacerbates operational inefficiencies, increases systemic risks, and contributes to economic instability.

The findings indicate that liquidity shortages significantly constrain banks' ability to maintain adequate cash reserves, limiting their capacity to meet customer withdrawals and reducing credit availability. This aligns with previous studies such as Ai et al. (2020), who emphasize that liquidity constraints hinder banks' ability to allocate capital efficiently. A strong positive correlation ($r = 0.410$) was observed between liquidity shortages and banking instability, reaffirming that financial stress weakens the overall sector resilience. Similarly, exchange rate volatility was found to have a destabilizing effect ($r = 0.422$), adding to the operational difficulties faced by financial institutions.

Historical financial crises, including the 2008 U.S. financial crisis and liquidity challenges in conflict-affected economies, such as South Sudan and Afghanistan, highlight the far-reaching consequences of liquidity constraints. Reduced investment, slow economic growth, and increased financial instability are common outcomes. Policymakers should consider targeted interventions, such as liquidity support mechanisms, alternative financing solutions,

and fintech innovations, to enhance financial inclusion and credit accessibility.

Impact on Financial Intermediation, Credit Availability, and Banking Instability

The regression results indicate that weak intermediation capacity ($\beta = 0.373, p = 0.003$) exacerbates banking instability. Limited liquidity restricts lending as it hinders financial intermediation and economic growth. This finding is supported by empirical evidence from emerging markets such as Argentina and Venezuela, as high exchange rate volatility has historically disrupted financial stability (Stoica and Ihnatov, 2016).

To mitigate these risks, targeted financial aid for banking institutions, promotion of alternative funding sources, and integration of fintech solutions should be prioritized. Policymakers must implement progressive exchange rate stabilization strategies, enhance central bank autonomy, and strengthen monetary policy frameworks to manage inflation and maintain currency stability.

Erosion of Public Trust and Banking Sector Stability

The persistent liquidity crisis and exchange rate volatility have significantly eroded public trust in the banking system in Yemen. A high level of concern regarding these challenges (mean = 4.33) underscores the urgency to restore confidence. As Gultom and Siregar (2022) warned, prolonged financial uncertainty increases the risk of bank runs, further destabilizing the system. The failure of new banknotes to resolve cash shortages (mean = 4.09) highlights the crisis's deep-rooted nature.

A significant correlation ($r = 0.415$) is found between liquidity shortages and monetary policy implementation challenges, suggesting that financial instability directly impairs the effectiveness of regulatory

measures. Previous financial crises, such as Lebanon's banking collapse, demonstrate that trust plays a critical role in maintaining financial stability. Countries that successfully implemented deposit insurance schemes and transparency initiatives were able to restore confidence in their banking institutions.

Policymakers should prioritize banking transparency, introduce deposit insurance schemes, and launch public awareness campaigns to improve financial literacy to rebuild trust. These measures can boost public confidence in the banking sector in Yemen and contribute to its long-term stability.

Structural Reforms and Long-Term Resilience

This study identifies weak solvency ($\beta = 0.416$, $p < 0.001$) and limited financial intermediation ($\beta = 0.373$, $p = 0.003$) as major structural weaknesses within Yemen's banking sector. Similar challenges are observed in other conflict-affected economies, necessitating long-term reforms to address the deep-rooted financial instability. A moderately positive correlation ($r = 0.353$) between weak intermediation and instability highlights the pressing need for structural adjustments.

The post-crisis banking reforms in Greece and Spain demonstrate the effectiveness of recapitalization and regulatory tightening in restoring financial stability. Additionally, investments in fintech and digital banking in Africa have improved financial inclusion, offering a viable path to Yemen's banking recovery. Key reform priorities include strengthening regulatory frameworks, increasing bank capital buffers, upgrading banking infrastructure, and encouraging mergers to create more resilient financial entities.

International Cooperation and Support for Reform

The study also emphasizes the role of international cooperation in stabilizing Yemen's banking sector. A moderate positive correlation ($r = 0.363$) was found between the corresponding banking restrictions and financial instability, highlighting the importance of reintegrating Yemen into global

financial networks. International financial institutions such as the International Monetary Fund (IMF) and the World Bank play a crucial role in stabilizing post-conflict economies, such as Bosnia, Herzegovina, and Liberia. These examples provide valuable insights into Yemen's economic recovery.

Key recommendations include seeking international technical assistance for banking reforms, restoring correspondent banking relationships, and securing liquidity support from regional and global financial systems. Lessons from Southeast Asian economies show that reintegration into global financial networks fosters both stability and growth. By leveraging these insights, policymakers can lay the groundwork for financial sector stabilization and broader economic recovery.

Conclusion

This study highlights the significant impact of liquidity shortages, exchange rate volatility, and structural weaknesses on the banking sector in Yemen. Our findings demonstrate that these factors contributed to banking instability, reduced credit availability, and weakened financial intermediation. Broader economic consequences include decreased investment, slower growth, and exacerbated financial instability, which have been observed in past global crises and conflict-affected regions.

The erosion of public trust in Yemen's banking system has further intensified financial instability. Policy recommendations to address this issue include enhancing transparency, introducing deposit insurance schemes, and implementing financial literacy programs to restore confidence.

Additionally, structural reforms in regulatory frameworks, banking capital, and technological infrastructure are critical for long-term sectoral resilience. Drawing on successful post-crisis reforms in Greece, Spain, and emerging African markets, this study emphasizes the importance of digital transformation and financial innovation for rebuilding the banking sector.

International cooperation remains vital for Yemen's economic recovery. Reintegrating the country into global financial networks,

restoring corresponding banking relationships, and securing technical and financial support from international institutions can contribute significantly to banking sector stability.

By implementing these policy measures, Yemen can strengthen its financial sector, enhance its economic resilience, and pave the way for sustainable recovery.

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