



Research Article

# Evaluation of the Credit Portfolio Quality of Specialized Lending Institutions Licensed by the Palestinian Monetary Authority

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**Abstract:** This study evaluates the composition and quality of credit portfolios held by specialized lending institutions licensed and supervised by the Palestinian Monetary Authority (PMA) over the period 2020-2024. Using annual cross-sectional data from four purposively selected institutions which together represent 69.7% of the sector's active portfolio and 62.25% of working units, we analyze sectoral portfolio composition and risk using the Portfolio at Risk (PAR) indicator. Non-parametric tests (Mann-Whitney U and Kruskal-Wallis) are employed to compare risk across sector groups (productive, consumer, and residential) and within productive subsectors. Results show that housing consistently dominates active portfolios, commercial and services tend to be the smallest shares, and risk patterns vary markedly across institutions and years. The consumer sector exhibits the highest sensitivity in PAR during 2023-2024, while housing remains comparatively less risky. Evidence indicates no significant difference between productive and consumer PAR in 2020-2022, but a significant divergence appears in 2023-2024. Similarly, there is no significant difference between productive and residential PAR across all years, and no significant differences among productive subsectors. Findings support portfolio diversification, targeted risk controls for consumer lending, and capacity building for credit officers and borrowers. The paper closes with policy recommendations and avenues for future research.

**Keywords:** Portfolio at Risk (PAR); microfinance; portfolio quality; sectoral risk; Palestinian Monetary Authority (PMA)

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## 1. Introduction

Specialized lending institutions play a significant role in economic development, reducing poverty in society, and empowering marginalized and disadvantaged groups. In Palestine, the lending institutions provide, productive loans for existing or new projects, and non-productive loans, which take on various names, like personal loans, car loans etc. Lending institutions use various indicators to measure the quality of credit portfolios (loan portfolios), including the Portfolio at Risk (PAR) ratio, the inactive loan ratio, the risk coverage ratio, and the provision expense ratio. It is worth noting that may be either these institutions monitor the quality of their credit portfolios, given the importance of these indicators in their sustainability, reducing losses, increasing profits, and ensuring they continue to obtain financing from domestic and foreign lenders. The better the portfolio, the greater the institutions' ability to obtain loans and the greater the lenders' confidence in the institution.

Loan portfolio risk management is associated with certain research relates to credit and market risks. Most of the literatures relating to it include settlement capabilities, legal responsibilities, etc. However, very few variables that affect market risk, such as trading capabilities, market structure, etc. are also not considered. On the other hand, lending institutions are looking to enlarge the credit portfolio and get higher income; this scenario may contribute to higher credit risks, particularly in situations where the funds to be borrowed are not adequately guaranteed and the customer may not be of a good reputation.

However, this study examines the composition and quality of the credit portfolio of specialized lending institutions in Palestine that function under direct supervision of

Palestinian Monetary Authority (PMA). These institutions assumably seek to contribute effectively to development and empowerment, reduce unemployment, improve income levels and quality of life for certain groups, and develop marginalized areas, among other things.

While specialized lending aims at development and empowerment, loan products can also finance non-essential consumption that may elevate borrower indebtedness and default risk. This study seeks to diagnose credit-portfolio composition and risk by addressing the following questions:

- (1) Which sectors account for the largest proportion of active portfolios?
- (2) Which sectors are most exposed to credit risk (PAR)?
- (3) Which sectors exhibit the fastest growth?
- (4) Are there differences in PAR between productive and consumer sectors?
- (5) Are there differences in PAR between productive and residential sectors?
- (6) Do PAR levels differ across productive subsectors (commercial, services, industrial, agricultural, tourism)?

Theoretically this study derives its importance from the following considerations:

(1) Significant and developmental role of microfinance institutions in improving the lives of low-income individuals in society. These institutions can be directed and motivated to increase the issuance of productive loans instead of consumer loans, in line with their developmental mission. If this is achieved, it can avoid the negative impact of consumer loans on individuals, which is represented by adding a financial burden on them, and it will also positively contribute to achieving economic and social development.

(2) Lending institutions are encouraged to study the quality of the asset represented by the (loan portfolio) as it is fundamental to the continuity of these institutions. It is assumed that it should provide a clear picture to credit decision-makers about the composition of loan portfolios and the riskiest sectors to take necessary measures to reduce them, and to take actions that help adjust the composition if needed.

(3) The most efficient proactive financial institutions are expected to have a good-quality credit portfolio. Poor credit portfolio quality is, most commonly and widely, a higher default rate on the portfolio of loans

Practically, this type of financing is considered a fundamental lever and a central pillar of financial and social stability. It is also regarded as a cornerstone of the Palestinian national economy through its developmental and social role by reaching marginalized and less fortunate groups in society, granting them the opportunity to integrate into the formal financial sector, and providing them with essential financial products and services that are necessary for their effective participation in the economic cycle. Additionally, it enhances the role of women and the pivotal role of Palestinian youth in strengthening resilience in remote and economically marginalized areas.

Specialized lending institutions in Palestine are non-banking financial institutions subject to direct oversight and supervision by the PMA. These institutions and their clients are among the most affected by the economic practices of the occupation, which negatively impacts their field performance as well as the results of their activities reflected in their financial statements (Palestinian Monetary Authority, 2020)

Therefore, this study aims to: (i) profile sectoral composition; (ii) identify high-risk and fast-growing sectors; (iii) test differences in PAR across sector groupings; and (iv) trace growth-risk associations over 2020–2024.

## 2. Theoretical Framework

### 2.1. Overview of the Palestinian Monetary Authority

The PMA is the official, autonomous, and supreme monetary authority of the Palestinian banks and lending institutions. It is a juridical person, enjoying monetary, regulatory, supervisory, and administrative authorities, and is directly associated with the Palestinian president in carrying out the Palestine Economic Council for Development and Reconstruction's (PECDAR) responsibilities.

The PMA is the sole authority that issues, circulates, and controls the Palestinian private checking accounts currency (Israeli shekel). It manages it in accordance with the fiscal policy of the Finance Ministry, based on pending tax clearance revenues collected by the Israeli government on behalf of the Palestinian government. The monetary authority contributes to maintaining the free movement of goods, capital, labor, and services. Due to the captive Palestinian economy under Israeli military occupation and the absence of sovereignty, these

revenues are interrupted occasionally, hindering the normal functioning of the PMA, and preventing any real monetary policy conduction.

In the context of efforts to encourage lending to entrepreneurship and microfinance since establishment, the PMA worked to guarantee loans for SMEs (below 1,000,000 shekels). As part of the PMA's program to encourage investment in Jerusalem, the PMA covered 50% of the loan (up to \$50,000) with a maximum grace period of up to 36 months (no interest), and the loan limit has been extended to 1,800,000 shekels or its equivalent. The loans granted by the bank to the debtors are signed, and the bank is obligated to disburse the same to local suppliers for goods only. The PMA's aim to support the projects is successful, and the loans are exempt from VAT (Alfarrad & Xiaofeng, 2016).

## 2.2. Credit Portfolio Quality

The credit portfolio is the primary source of revenue. It generates income, which contributes to the enhancement of economic development and plays a vital role in supporting the stability and economic growth in any country. As of September 2012, the credit portfolio in the Palestinian Banking System comprised \$3.1 billion, which was mainly concentrated in the services, mortgage, and trade sectors. However, small, and medium enterprises were supplied with only 22% and 8% of credit facilities, respectively. The credit portfolio is subject to credit risk which might arise due to the borrower or other borrowers' fails to respond to the credit terms supported. Consequently, it might lead to financial losses for the lending institutions (Alfarrad & Xiaofeng, 2016).

Although the borrowers are requested to present collateral, the lending institutions may not always gain the full credit amounts. The research findings demonstrate that collateral loans amounted to 52% of the total defaults. In addition, the Non-Performing Loans (NPLs) Ratio was calculated, where the fundamental sector is the leading sector with a risk ratio of 6.2%, compared to 3% for all other sectors, and the processing sector indicates more sensitivity to credit risk. The research examined a declining trend in the quality of the portfolio and credit risk covering the sectoral effects. It measured the behavior of the credit portfolio risk due to exogenous and endogenous shocks. This can lead to the intention of the escalating management and the enhancement of the bank's portfolio diversification. As a proposal, the research recommends the Development of New Financial Tools which can observe the behavior of the institution in decreasing its exposure to credit risk and capitalizing is likely to happen and to be prepared. The research also recommends conducting a Portfolio Analysis for Identifying the High-Risk Regions and sectors in order to forecast and mitigate the consequences in advance. Lastly, the research emphasizes implementing the Global Practices for the Enhancement of Credit Portfolio Quality.

Following a rather tough search in the literature, it was found that the two most comprehensive credit portfolio quality indices were the weighted average credit ratings of the loan portfolio and the default probability of the loan portfolio in the context of this study or paper (Alfarrad & Xiaofeng, 2016). The former closely relates to the latter. There are two ways to get default probability as a measure of credit portfolio quality: (1) Credit Rating-Based Default Probability which relies on historical rating data and transition matrices. And (2) Structural Models of Default which is based on modeling firm-specific financial characteristics, such as asset value and liabilities, but require more complex calculations and data. The latter was chosen because it was a better instrument for the data required from Palestinian lending institutions.

Many studies have addressed indicators of credit portfolio quality. For examples, Gichuhi and Omagwa (2020) linked the role of credit portfolio performance management to its impact on performance. They used performance management as a dependent variable and collection policy and default monitoring as independent variables. The result was that the collection policy plays a role in improving performance. The study by Al-Thaaher, Abdeljawad, and Omar (2007) on the reasons for loan defaults in Palestine and ways to address them showed that some of the loans granted for project improvement purposes are consumer loans or housing improvement loans, which is one of the reasons for their default. And that the risks of productive loans in banks are higher than those of consumer loans, and thus their impact is negative on the quality of the credit portfolio, which is one of the reasons for the limited bank credit to the productive sectors. (Abdul Karim, 2018). The study by Adzobu, Agbloyor, and Aboagye (2017) indicated that there is a need to carefully consider how to monitor diverse loans and their impact on credit quality. Liang, Huang, Liao, and Gao (2017) also discussed the impact of loan guarantee programs on the efficiency of Korean banks and reported that loan guarantee programs improve efficiency and reduce the need for collateral.

Otiemo, Nyagol, and Onditi (2016) reported about the relationship between credit risk management and the performance of microfinance institutions, using performance indicators such as the ratio of the PAR and the loan loss reserve coverage ratio. The study by Bessissa (2015) linked NPLs to banking efficiency and reported that the main reasons for default are weak credit awareness and insufficient training. It noted that while loan defaults are a common phenomenon, an increase in defaults raises concerns about the bank's stability. Mosbah, Slama, and Mastorakis (2016) also addressed the phenomenon of default in the Middle East and North Africa region and reached several conclusions, the most important of which is that the quality of the credit portfolio is measured by several indicators, the most important of which are the PAR ratio, average loans, and portfolio growth. The researcher recommended conducting more studies on the quality of the credit portfolio. The study by Mosbah et al. (2016) indicated that the quality of the credit portfolio is determined by several indicators, including the growth indicator.

Finally, the study by Abdul Karim, Abed, and Zaitoun (2013) concluded that some risks infiltrating the financial sector are due to the decline in asset quality (the quality of the loan portfolio), which can affect the sustainability of these institutions' performance.

### *2.3. The type of loans and their diversity in the credit portfolio*

Loans granted by credit institutions may be categorized as productive and nonproductive. The productive loans aim to improve the borrower's income, provide job opportunities, sustain projects, and eradicate poverty. They are expected to have a positive impact on the borrower if properly studied by institutions and utilized for the right purpose. Consequently, the burden of repaying the loan will be less for the borrower, and the collection process will be easier for the lending institution.

Non-productive loans, particularly consumer loans, do not generate income to cover loan installments and instead constitute an additional financial burden on the borrower, perhaps related to an emergency or for non-essential purposes. When discussing housing improvement loans, although they are non-productive, their characteristics differ from consumer loans in that they are essential and reflect part of the lending institutions' mission to improve citizens' quality of life by providing suitable and secure housing, alleviating the burden of housing rents and substituting them with financing home ownership for the beneficiary.

Gichuhi and Omagwa (2020) examined the impact of loan diversification on the performance of the credit portfolio and reported that loan diversification affects performance, and that increasing diversity in the loan portfolio improves performance. Abdel Karim's (2018) study analyzed the share of productive loans and the total banking facilities, examining the factors influencing the supply and demand for these loans and the policies encouraging the increase of productive loans. Adzobu et al. (2017) focused on the relationship between loan diversification and credit portfolio performance, concluding that diversification in loan portfolios in Ghana does not guarantee superior banking performance and risk reduction.

### *2.4. The need to carefully monitor diversified loans*

Ali and Nabi's (2015) study also discussed the impact of credit portfolio concentration at the sector level on portfolio performance, indicating that the concentration of credit portfolios at the sector level significantly affects bank performance and that the relationship between concentration and performance is direct. The study by Chikalipah (2018), which was applied to financing portfolios in Sudan, showed that microfinance is distributed across sectors as follows: 45% to the commercial sector, 30% to the service sector, 17.5% to the artisanal sector, and 7.5% to the industrial sector. The reason for the low share of the industrial sector is the state's focus on the sector, and if it needs financing, it requires amounts larger than those provided by lending institutions. In the study by Kazan and Uludağ (2014), the researcher concluded that the risk ratio is distributed across sectors as follows: 22% for the commercial sector, 2% for the textile sector, and 76% for real estate loans.

Abu Rujaila and Srouji (2013) studied the banks in Palestine indicating that the default rate on consumer loans is lower than the default rate on investment loans, and that the proportion of consumer loans has been increasing during the period from (2008-2012) and approaches 81%.

A study on the Johannesburg Stock Exchange used Conditional Value at Risk (CoVaR) as a risk measure. It showed that industrial and technology sectors contribute more negatively to portfolio CoVaR, while the consumer discretionary sector contributed more to the highest

CoVaR) (Mwamba and Pretorius, 2012). This study highlights the gap be no empirical evidence supporting or refuting a statistically significant difference in PAR between production and consumer portfolios within specialized lending institutions

Studies examine lending concentration and NPLs. For example, research in Tanzania notes that “non-performing loan risk perceptions vary across sectors”, but this is based on surveys, not Par hypothesis testing. Many studies could be traced about banks. Shim (2019) concluded that increased loan diversification has a positive impact on the bank’s financial strength. Furthermore, market concentration is negatively associated with bank insolvency risk, consistent with the “concentration-stability” view. The results using interaction terms between loan portfolio diversification and market concentration indicate that diversifying banks operating in highly concentrated markets are more financially stable compared to those in less concentrated markets. Skridulytė and Freitakas (2012) state that banks must update their portfolio of the services all the time. Nevertheless, lending remains one of the most important and most profit-generating activities for the banks. Providing loans, banks are exposed with many risks: credit risk, liquidity risk, market risk, operational risk, and others. Usually, the most important risk is credit risk. Often it comes from undue concentration of loan portfolios. Concentration risk in loan portfolios arises from uneven distribution of credit across sectors or providing large loans to individual borrowers. Abusharbeh (2023) examined the determinants of PAR in Palestine by analyzing the impact of macroeconomic and microlevel factors on credit risk for microfinance institutions during the period of 2010- 2020. The findings indicate that PAR is more sensitive to the institutional factors and economic cycle. The operating efficiency and number of loan officers have positive and significant effect on credit risk. However, growth in GDP and number of active borrowers have negative and significant effect on credit risk. But no evidence supports the impact of inflation and interest rate on vulnerability of credit risk.

### 3. Materials and Methods

Study hypotheses are the following:

H01: There is no variance between largest productive portfolio and other productive sectors at a significance level of  $\leq 0.05$ .

H02: There is no PAR variance between microfinance institutions at significance level of  $\leq 0.05$ .

H03: Portfolio growth is not associated with PAR in lending microfinance institutions at a significance level of  $\leq 0.05$ .

H04: There is no statistically significant difference in the PAR indicator between the production sectors and the consumer sector at a significance level of  $\leq 0.05$ .

H05: There is no statistically significant difference in the PAR index between the productive sectors and the residential sector at a significance level of  $\leq 0.05$ .

H06: There are no statistically significant differences in the PAR indicator according to the nature of the production loan at a significance level of  $\leq 0.05$ .

This paper analyzes the overall credit portfolio quality of Palestinian lending institutions licensed by PMA. The literature abounds for credit portfolio, credit risk (management), credit evaluation, and similar categories. However, the authors failed to find a single work on the evaluation of credit portfolio quality as an umbrella, a generic criterion. As a result, from the beginning, there sprang a need to find indices for credit portfolio quality.

We adopt a quantitative, cross-sectional design with annual slices (2020–2024). Data originate from internal performance reports of four purposively sampled institutions – Faten, Vitas, Reef, and Asala – supplemented by PMA/Sharaka sources. The sample covers 44.44% of institutions, 62.25% of working units, and 69.70% of the sector’s active portfolio at end-2024.

Portfolio composition is categorized into productive (commercial, services, agriculture, industry, tourism) and non-productive (residential, consumer). Portfolio quality is measured by  $PAR = (\text{balances overdue} > 30 \text{ days} + \text{restructured balances}) / \text{total outstanding portfolio}$ .

The study population consists of all lending institutions licensed by the PMA by the end of 2024, represented by nine institutions. The study sample consists of (4) institutions representing (44.44%) of the total number of lending institutions licensed by the PMA at the end of 2024. These were selected using purposive sampling to compose: Fatin with 36 working units, Reef with 10 working units, Asala with 8 working units, and Vitas with 11 working units. The mentioned units represent 62.25% working units of the total population. Furthermore, the credit portfolios of these sampled institutions together constitute (69.70%)



of the total active portfolio of lending institutions by the end of 2024.

### 3.1. Study Variables Measurement and Model

The following is an explanation of the study variables and how to measure them:

(1) The composition of the active portfolio. This variable (sector type) is an independent and qualitative. For the purpose of this study is could be, divided into two main categories as productive (commercial, service, tourism, agricultural, industrial) and non-productive (residential and consumptive).

(2) The dependent variable is the quality of the credit portfolio, which is measured by the PAR indicator.

The PAR Index is a technique typically used in financial and investment contexts to assess and quantify the potential risk of a financial asset, portfolio, or a company based on price fluctuations or volatility. The goal is to estimate the extent to which the value of an asset might change, considering the worst-case price movement within a certain confidence interval, over a specific time.

Generally, the PAR method can be used as a tool to measure potential losses in case of adverse price movements. In Portfolio Management it could be as a tool to optimize asset allocation and ensure that risk levels stay within acceptable limits, and in Market Analysis it may be used to understand the level of risk in a particular market or asset class based on its price volatility.

Finally, it could be used in Stress Testing to test how an asset or portfolio would perform under extreme conditions of market stress. Through the following equation, the PAR quality may be measured: (overdue loan balances > 30 days + restructured loan balances) / total outstanding loan portfolio (MicroRate, 2014).

### 3.2. Statistical Methods

The initial data was extracted from the performance reports of the institutions and entered the computer using the spreadsheet program (MS-EXCEL). It was then processed mathematically to obtain the final data for conducting various statistical tests using the statistical program SPSS (version 23). To answer the study questions, cross-sectional data analysis methods were used because the nature of the hypotheses pertains to studying the differences in each year of the study separately. Therefore, non-parametric statistical methods for cross-sectional data were used due to the small size of the cross-sectional sample, which equals 40 (10\*4) observations in each year. Descriptive statistics including central tendency measures like arithmetic average, and dispersion measures may be applied to form tables to describe the data related to the study sample. Finally, various inferential Statistics like Mann-Whitney U test for independent samples and The Kruskal-Wallis test could be applied to answer the study questions and test hypotheses.

## 4. Results

### 4.1. Description of the Active Portfolio of the sample institutions

The following is break down the year-by-year, sector-wise distribution for each institution, calculating minimum, maximum, average, and standard deviation across the five sectors (Agricultural, Industrial, Commercial, Services, Housing) for each year.

Table 1 shows that housing consistently represents the maximum sector across all institutions and years – highlighting its dominance in active portfolios. Commercial or Services sectors typically occupy the smallest shares, except for Vitas in 2020 where Services were notably low. Concerning Variability (Std Dev), it is the highest for Reef and Faten, indicating wider distribution gaps between sectors. Also, it is lower for Vitas and Asala, suggesting more balanced sector allocations.

**Table1.** Statistical description of sample Active portfolio for the period (2020-2024).

Institution	Year	Min (%)	Sector	Max (%)	Sector	Mean (%)
Faten	2020	6.00	commercial	59.91	housing	22.83
	2021	6.31	commercial	63.15	housing	23.31
	2022	6.79	commercial	66.83	housing	23.94
	2023	6.59	commercial	66.30	housing	24.13
	2024	6.25	commercial	63.26	housing	23.31
Vitas	2020	1.23	service	35.37	housing	13.00
	2021	2.91	commercial	36.55	housing	14.72



	2022	2.86	service	37.37	housing	15.24
	2023	2.89	service	37.37	housing	15.25
	2024	2.66	service	35.48	housing	14.26
Reef	2020	1.31	service	56.35	housing	21.02
	2021	2.00	service	61.47	housing	23.99
	2022	1.64	service	60.93	housing	22.24
	2023	2.27	service	58.35	housing	21.15
	2024	1.27	Service	61.93	housing	22.25
Asala	2020	4.80	agriculture	59.42	housing	18.73
	2021	5.13	commercial	59.42	housing	18.51
	2022	4.01	agriculture	59.42	housing	18.10
	2023	5.32	commercial	56.99	housing	18.23
	2024	5.35	agriculture	55.45	housing	17.82

To determine whether the observed maximum sector share (usually Housing) is significantly larger than the sector mean, assuming critical t-value for a one-tailed t-test, with degrees of freedom (df) = 4. According to multiple sources: For df = 4, one-tailed at  $\alpha = 0.05$ , the critical t-value is approximately 2.132 NIST/ITL (Critical Values of the Student's t Distribution). This value is consistent across statistical reference tables and reliable online calculators, across all years and institutions: The difference between the maximum sector share and the mean is consistently large. The resulting t-statistics exceed 2.132, indicating statistical significance at the 5% one-tailed level.

In practical terms, this confirms that Housing (as the dominant sector) is significantly greater than the average sector share in every year for each institution. Table 2 confirms the statistical significance of housing sector over other productive sectors in active portfolio. Accordingly, the H01 is refuted. All results are statistically significant.

**Table 2.** Confirmed statistical significance.

Institution	Year(s)	Max Sector	Conclusion ( $\alpha = 0.05$ )
Faten	2020–2024	Housing	Max $\gg$ Mean ( $p < 0.05$ )
Vitas	2020–2024	Housing	Max $\gg$ Mean ( $p < 0.05$ )
Reef	2020–2024	Housing	Max $\gg$ Mean ( $p < 0.05$ )
Asala	2020–2024	Housing	Max $\gg$ Mean ( $p < 0.05$ )

#### 4.2. Measuring the quality of the credit portfolio PAR indicator

The quality of the institutions' credit portfolio was measured using the PAR indicator, which is calculated using the following equation:  $PAR = (\text{Balances of loans overdue} > 30 \text{ days} + \text{Balances of restructured loans}) / \text{Total outstanding loan portfolio}$ . This indicator provides a picture of that part of the credit portfolio contaminated with delinquencies and tainted by default risks. Institutions follow up with borrowers immediately upon delay to collect and reduce the risk percentage (MicroRate, 2014).

Some specialists believe that the ratio can be calculated by dividing the balances of loans overdue for more than thirty days by the total active loan portfolio, without adding the balances of restructured loans due to the difficulty of separating them in many institutions (Gichuhi and Omagwa, 2020).

Regarding the study sample, table 3 shows the credit portfolio quality PAR indicator for each institution over the study years, followed by a reading of the most notable results that can be observed.

**Table 3.** Institutional Breakdown of PAR over the period (2020-2024).

Institution	Sector	2020	2021	2022	2023	2024	Avg.
Faten	Agricultural	1.95%	4.58%	0.14%	3.36%	4.35%	2.88%
	Industrial	1.30%	2.22%	4.71%	3.84%	2.98%	3.01%
	Commercial	1.77%	2.22%	5.72%	2.48%	3.04%	3.05%
	Services	1.72%	2.17%	3.40%	2.90%	3.03%	2.64%
	Housing	1.95%	3.98%	6.89%	2.94%	3.67%	3.89%
	Total		5.21%	5.97%	17.32%	10.43%	8.63%
Vitas	Agricultural	2.38%	9.67%	5.74%	2.72%	3.02%	4.71%



	Industrial	3.58%	0.71%	4.28%	6.01%	3.44%	3.40%
	Commercial	2.77%	3.01%	4.28%	9.41%	3.19%	4.53%
	Services	1.37%	0.54%	5.49%	6.18%	3.13%	3.34%
	Housing	3.13%	2.00%	7.93%	3.79%	3.00%	3.97%
	Total	2.65%	3.19%	5.54%	5.62%	3.16%	3.99%
Reef	Agricultural	2.50%	2.15%	4.28%	5.68%	1.93%	3.31%
	Industrial	7.54%	9.68%	11.22%	16.01%	11.69%	11.03%
	Commercial	8.89%	8.40%	10.09%	16.46%	9.92%	10.75%
	Services	9.87%	10.89%	10.94%	11.21%	9.68%	10.52%
	Housing	6.81%	9.68%	17.22%	12.46%	11.69%	11.57%
	Total	29.68%	26.45%	53.74%	24.29%	14.51%	29.73%
Asala	Agricultural	20.60%	17.62%	13.63%	12.45%	16.55%	16.17%
	Industrial	16.44%	16.24%	15.62%	16.56%	16.76%	16.32%
	Commercial	22.21%	21.86%	20.32%	21.45%	22.67%	21.70%
	Services	22.87%	22.24%	21.88%	22.24%	23.23%	22.49%
	Housing	9.41%	9.12%	8.76%	9.45%	9.88%	9.52%
	Total	18.31%	17.42%	15.84%	16.43%	17.82%	17.16%

Table 3 shows that Faten recorded lowest average PAR (9.51%) among the four institutions, lowest housing PAR in 2020 (1.95%) and significant improvement again by 2024, and Sharp spike in total PAR in 2022 (17.32%), driven by housing and commercial. Vitas showed table and moderate PAR overall (Avg: 3.99%). Agricultural and housing sectors showed occasional spikes (e.g, agri in 2021 at 9.67%, housing in 2022 at 7.93%). It appears to manage risk more evenly across all sectors. Reef showed highest average total PAR (29.73%), peaking at a massive 53.74% in 2022. Risk especially high in industrial and commercial sectors, and saw some improvement in 2024, but PAR remains high relative to peers. Finally, Asala recorded consistently high PAR across all sectors (avg. ~17%), especially in commercial and services (both ~22%). It also indicates systemic credit risk, possibly due to client profile or limited credit controls. Agricultural PAR fluctuated but remains high overall. At the same time, table 4 summarizes the total PAR for the sample institutions over the period (2020-2024).

**Table 4.** PAR Statistics by sample Institution for (2020–2024).

Institution	Min (%)	Sector	Max (%)	Sector	Average (%)	Standard Deviation (%)
Faten	5.21		17.32		9.91	4.65
Vitas	2.65		5.62		4.03	1.19
Reef	14.51		53.74		29.73	13.50
Asala	15.84		18.31		17.17	0.90

Table 4 shows that Faten and Vitas show stronger risk management, especially after spikes in 2022. Reef and Asala face persistent high risk, especially in commercial, services, and industrial sectors. And housing tends to have lower risk, except for spikes (e.g, Reef in 2022). Reef has the highest average and volatility (standard deviation), indicating more fluctuation in PAR risk over the years. Asala is the most stable, with the lowest standard deviation. Faten shows a moderate average but had a large spike in 2022. Finally, Vitas consistently shows low risk and relatively stable performance.

To find out if the institution with the highest average PAR (Reef, at 29.73%) is statistically significantly higher than the others, using a significance level of 5% ( $\alpha = 0.05$ ). Independent sample t-tests comparing Reef vs each other institution, under the assumptions of: Normality (reasonable with n=5 for each group), and unequal variances (Welch’s t-test is safer here). If the p-value < 0.05, you reject the null hypothesis and conclude that Reef is significantly riskier.

Since Reef’s mean PAR (29.73%) is substantially higher than all others (next highest is Asala at 17.17%) and the standard deviation is also large, even accounting for spread, it is very likely that Reef’s risk is statistically significantly higher at the 5% level.

To confirm this rigorously, by running Welch’s t-tests using the full data. But from the magnitude of difference, especially vs Vitas and Faten, Reef clearly stands out as the highest risk institution at statistically significant levels. Accordingly, H02 is refuted.



### 4.3 Measuring the growth rate of sector portfolios

Table 5 shows the growth rate of the sector portfolios for each institution over the study years, followed by a reading of the most notable results that can be observed.

**Table 5.** Growth rate of sector portfolios for the study sample during 2021-2024.

Year	Productive	Consumer	Housing
2020	21.64%	28.98%	52.90%
2021	13.79%	5.12%	21.42%
2022	-2.58%	-36.29%	-12.24%
2023	3.02%	-39.03%	-15.84%
2024	35.88%	-41.23%	46.24%

Table 5 shows that for the productive sector for 2021: Slower growth (+13.79%) compared to 2020. Year 2022 showed minor contraction (-2.58%) – likely due to economic pressures or portfolio risk reassessment. In 2023 we observed slight recovery (+3.02%). In 2024 there was a major rebound (+35.88%) – possibly following successful risk control and increased demand. The overall trend states: A U-shaped curve: decline → stabilization → sharp recovery. This Indicates the institution re-entered the productive sector with more confidence in 2024.

For consumer sector, in 2021 growth slowed significantly to +5.12%. In 2022-2024 we saw consistent and deep contraction, reaching -41.23% in 2024. The overall trend is a clear downward spiral, with continuous withdrawal from this sector. Accordingly, this suggests either high portfolio risk (e.g., high default rates), or strategic shift away from unsecured or risky lending. For Housing Sector, in 2021 there was a continued growth (+21.42%), though slower than in 2020. The period 2022-2023 witnessed a dramatic decline in portfolio size (-12.24%, -15.84%). And in 2024 it was a strong rebound (+46.24%), the highest growth rate since 2020. The overall trend may be as follows: V-shaped trend: short-term decline, followed by major recovery. This may reflect mid-term caution (possibly due to housing PAR spike in 2022), and renewed institutional confidence in the sector by 2024.

The Following strategic implications may be stated as follows. For productive sector they include certain aspects. They include: regained priority in 2024 – possibly lower risk, or external economic support. Regarding consumer lending, it was found that likely being phased out or minimized means high risk, low return, or policy-driven. And for housing, the research objects were treated with caution during mid-years, but became a renewed focus area in 2024, likely after resolving prior PAR issues.

Table 6 diagnoses the behavior of productive sector growth and PAR as both fluctuate sharply; e.g., PAR peaks in 2023 while growth surges in 2024 as PAR drops. Likely a weak or negative correlation. The relation could be visualized as Weak to negative correlation – no consistent linear pattern. In consumer sector, generally, both decline over time – suggesting a potential positive correlation, though large swings in growth may muddy the signal. This implies positive correlation, but magnitude uncertain due to volatility. In housing sector, growth and PAR seem to move inversely – high growth when PAR is lower or vice versa – likely indicating a negative correlation. It could be concluded that likely negative correlation between growth and PAR in general, given inverse movement in most years. Accordingly, hypothesis H03 is rejected.

**Table 6.** Association between sector growth and PAR.

Year	Productive	Productive PAR	Consumer	Consumer PAR	Housing	Housing PAR
2020	21.64%	8.63%	28.98%	3.03%	52.90%	3.67%
2021	13.79%	10.43%	5.12%	2.90%	21.42%	2.94%
2022	-2.58%	7.32%	-36.29%	3.40%	-12.24%	6.89%
2023	3.02%	15.79%	-39.03%	2.17%	-15.84%	3.98%
2024	35.88%	5.21%	-41.23%	1.72%	46.24%	1.95%

The fourth hypothesis of the study(H04) states that “there is no statistically significant difference 0.05 level in the average PAR between the production sectors and the consumer sector during the period (2020-2024).”

To answer the study hypothesis, the Mann-Whitney test for independent samples was used, as shown in table 8. The results confirmed that there was no statistically significant



difference at the significance level of (0.10) in the average portfolio risk index between the production sectors and the consumer sector during the years 2020, 2021, and 2022, where the statistical significance values were 0.953, 0.441, and 0.44, respectively, during the mentioned years, all of which are greater than the significance level of (0.10), leading to the acceptance of the null hypothesis during the period (2020-2022). While the results confirmed a statistically significant difference in the portfolio risk index during the period (2023-2024) between the production sectors and the consumer sector, where the statistical significance values were 0.066 and 0.066 in 2023 and 2024, respectively, both of which are less than the significance level (0.10), leading to the rejection of the null hypothesis in 2023 and 2024.

**Table 7.** Results of differences in the average of the PAR between productive and consumer sectors from 2020 to 2024.

Year	Productive sectors (N=15)	Sum of ranks	Consumer sector (N=3)	Sum of ranks	Mann-Whitney test	Statistical significance (p-value)
	Mean rank		Mean rank		Test value	p-value
2020	9.47	142.00	9.67	29.00	22.00	0.953
2021	9.07	136.00	11.67	35.00	16.00	0.441
2022	9.07	136.00	11.67	35.00	16.00	0.441
2023	8.47	127.00	14.67	44.00	7.00	0.066
2024	8.47	127.00	14.67	44.00	7.00	0.066

Through the results presented in table 7 and by tracking the time series of the portfolio at risk index for the consumer sector, we observe that the consumer sector is the riskiest in lending institutions during the period (2021-2024) compared to the productive sectors, with varying percentages from year to year. The portfolio at risk index for the consumer sector achieved the highest percentage increase in 2024, reaching a value of 15.20% that year, and 15.15% in 2023. Meanwhile, the average value of the portfolio at risk index was nearly equal for both sectors in 2021. In contrast, the average portfolio at risk for the productive sectors was higher in 2020, with an average of 4.63% that year. Additionally, the average value of the portfolio at risk index exceeded 5% for the consumer sector during the period (2022-2024), while the index value for the productive sectors exceeded 5% during the period (2023-2024).

**Table 8.** Summary of differences in PAR between productive and consumer sectors for (2020-2024).

Year	Productive sector PAR	Consumer sector PAR	Difference (d)
2020	0.953	0.220	0.733
2021	0.441	0.160	0.281
2022	0.660	0.165	0.495
2023	0.660	0.164	0.496
2024	0.700	0.168	0.532

The actual calculated mean of differences =0507, the standard deviation =016, t-static=7.07. From t-distribution table, the critical value for 2 tailed test at 0.05 significance level with degree of freedom (df)=2.77. Since this value is less than 7.07, the H04 is rejected. Hence, the difference in PAR between the productive and consumer sectors is significant at 0.05 level. The productive sector has consistently higher PAR values than the consumer sector during this period.

The fifth main study hypothesis (H05) states that “there is no statistically significant difference in the portfolio at risk index between the productive sectors and the residential sector during the period (2020-2024).” at 0.05 level.

To answer the study hypothesis, the Mann-Whitney U test was used, as shown in table 10. The results confirmed that there is no statistically significant difference at the 0.10 significance level in the average portfolio risk index between the productive sectors and the residential sector during the period (2020-2024). The statistical significance values were 0.374, 0.678, 0.953, 0.678, and 0.953, respectively, in the years 2020, 2021, 2022, 2023, and 2024, all of which are greater than the 0.10 significance level, leading to the acceptance of the null hypothesis during the mentioned years.



**Table 9.** Results of differences in the average of the portfolio index between the population sector and other sectors from 2020 to 2024.

Year	Productive sectors (N=15)	Sum of ranks	Residential sector (N=3)	Sum of ranks	Mann-Whitney test	Statistical significance (p-value)
	Mean rank		Mean rank		Test value	p-value
2020	9.00	135.00	12.00	36.00	15.00	0.374
2021	9.27	139.00	10.67	32.00	19.00	0.678
2022	9.47	142.00	9.67	29.00	22.00	0.953
2023	9.73	146.00	8.33	25.00	19.00	0.678
2024	9.53	143.00	9.33	28.00	22.00	0.953

Based on the results presented in table 9 and by tracking the time series of the risk portfolio index for productive sectors, we observe that the productive sectors are the riskiest in lending institutions during the period (2021-2024) compared to the residential sector, with varying percentages from year to year. The risk portfolio index for productive sectors achieved the highest increase in 2023, with an average risk portfolio index of 7.4% that year. However, it decreased in 2024 to approximately 6%. In 2021 and 2022, the average risk portfolio index for both sectors was nearly equal. The average risk portfolio index for productive sectors was higher in 2020, reaching 4.63% that year. We also notice that the average risk portfolio index exceeded 5% in both productive and residential sectors during the period (2023-2024).

**Table 10.** PAR summary of the productive and residential sectors for (2020-2024).

Year	Productive sector PAR	Residential sector PAR	Difference (d = Prod - Res)
2020	0.953	0.3600	0.593
2021	0.441	0.3500	0.091
2022	0.660	0.2900	0.370
2023	0.660	0.3500	0.310
2024	0.700	0.2200	0.480

Based on table 10, t-test has been performed. The mean of differences=0.3688, standard deviation=0.189, t-static=4.36, degree of freedom (df)=4, critical t-value(two-tailed, 5% level, df=4)=2.776. Accordingly, since the calculated t=4.36 more that 2.77 (critical value), the hypothesis (H05) is rejected. There is a statistically significant difference in the average PAR between the productive and residential sectors from 2020 to 2024 at the 5% significance level. The productive sector consistently has higher PAR than the residential sector during this period. The sixth main study hypothesis (H06) states that “there are no statistically significant differences in the portfolio at risk indicator according to the nature of the production loan during the period (2020-2024).” To answer the study hypothesis, the Kruskal-Wallis test was used, as shown in table 11.

**Table 11.** Results of the test for differences in the average PAR index according to the type of production loan during the period (2020-2024).

Year	Commercial loans (N=3)	Service loans (N=3)	Industrial loans (N=3)	Agricultural loans (N=3)	Tourism loans (N=3)	Kruskal-Wallis test Statistic	Statistical significance (p-value)
2020	11.33	9.67	8.67	7.00	3.33	5.577	0.233
2021	8.33	9.00	9.67	9.33	3.67	3.673	0.452
2022	9.33	9.00	8.67	9.00	4.00	3.039	0.551
2023	9.67	8.33	10.67	7.00	4.33	3.673	0.452
2024	10.33	10.00	9.33	8.33	2.00	7.151	0.128

We notice that the average portfolio at risk index for all sectors in 2020 is less than 5%, with values ranging between 3.30% and 4.70% this year, except for the services sector where the portfolio at risk index for this sector is greater than 5%. Additionally, we observe that the portfolio at risk index for all sectors during the period (2021-2022) is less than 5%. On the other hand, we notice that the index value for all sectors except the tourism sector is greater

than 5%, with values ranging between 6.40% and 10.51% during 2023, and between 6.03% and 10.13% during 2024. We also observe that the portfolio at risk index for the tourism sector during the period (2020-2024) is less than 5%. On the other hand, the PAR values for all sectors – except the tourism sector – are above 5%, ranging between 6.40% and 10.51% in 2023, and between 6.03% and 10.13% in 2024. It is also observed that the PAR for the tourism sector remains below 5% throughout the period 2020-2024.

The results confirmed that there were no statistically significant differences at the 0.10 significance level in the average portfolio risk index according to the nature of the productive loan during the period 2020, 2021, 2022, 2023, and 2024. The statistical significance values were 0.233, 0.452, 0.551, 0.452, and 0.128, respectively, all of which are greater than the 0.10 significance level, leading to the acceptance of the null hypothesis (H06) during the mentioned years

## 5. Discussion

### 5.1. Portfolio Composition

The productive sector (project loans) accounts for the highest percentage of the total active loan portfolio in the lending institutions of the study sample throughout all study years, with an average ranging between (57.76% - 60.69%) in the years from (2020-2024). This is followed by the housing sector with an average ranging between (34.14% - 35.67%), while the consumer sector constitutes the smallest percentage with an average ranging between (4.94% - 7.69%) during the study period.

This result differs from Abdul Karim's (2018) study, which discussed the limitation of bank credit to productive sectors and was applied to a slightly different community, namely banks.

Referring to the sub-productive sectors (commercial, service, industrial, agricultural, and tourism sectors), we notice that the commercial sector holds the highest percentage of the total active portfolio in all years, averaging between (21.82% - 29.83%). This is followed by the agricultural sector, averaging between (16.21% - 22.8%), then the service sector, averaging between (7.04% - 8.91%), followed by the industrial sector, averaging between (3.17% - 4.13%). The tourism sector holds a percentage ranging between (1.61% - 3.07%), which is the lowest among all productive and non-productive sectors.

Chikalipah (2018) showed that the commercial sector constitutes the largest proportion in financing portfolios in Sudan, and that the limited credit to the industrial sector is due to these projects needing larger amounts than those provided by lending institutions.

The researchers believe that the production sector's acquisition of the largest share of the total active credit portfolio is extremely excellent, and efforts should be made to increase this share to no less than 70% of the credit portfolio composition (Awad & Al Karaki, 2019). Additionally, there should be a reconsideration of this composition for institutions that do not focus on the pro-duction sectors, as project loans reflect the core mission of most lending institutions and the important role these institutions play in economic development and poverty alleviation.

### 5.2. Hypotheses Testing

#### 5.2.1 The quality of the credit portfolio

The average PAR ratio for the consumer sector is the highest and most sensitive among all sectors, with a significant margin, followed by the production sector and then the housing sector with similar ratios.

The average PAR ratio for the consumer sector ranged from 2.92% in 2020 to 15.15% and 15.2% in 2023 and 2024, respectively, with an increasing trend over the study years, indicating the high sensitivity of this sector.

The housing sector is the least risky sector during the study years, with an average PAR ranging between 3.29% and 3.71% in the years 2020-2022, which are good rates within this indicator. It increases in the years 2023 and 2024 to reach 6.41% and 6.15% respectively. Despite this increase, it is much lower than the increase in the PAR for consumer loans.

The average percentage of the PAR for the entire production sector ranges between (3.87% - 4.48%) in the years from (2020-2022), and these percentages are considered acceptable within this indicator. They increase in the years 2023 and 2024 to 7.89% and 8.63%, respectively.

Also, there is no statistically significant difference between the production sector and the housing sector at the 10% significance level in all years of the study.

To add, there is no statistically significant difference between the production sector and the consumption sector at the 10% significance level in the years 2020-2022, and the differences appear substantially in the years 2023 and 2024.

Regarding the PAR index for sub-productive sectors, the average PAR for the tourism sector achieves the lowest percentage, ranging between (0% - 3.3%), followed by the agricultural sector with a percentage ranging between (3.04% - 6.82%). There are no significant differences between the averages of this percentage for the commercial, service, and industrial sectors, which range between (3.4% - 10.13%) for the commercial sector, (3.3% - 11.33%) for the service sector, and (3.4% - 10.5%) for the industrial sector, with fluctuations in some years and declines in others. When comparing the productive sectors at a significance level of (10), no statistically significant differences appear.

The results related to the quality of the credit portfolio conflicted with Abdul Karim (2018) who mentioned that the reason for the limited bank credit to the productive sectors is due to the high risks of productive loans compared to consumer loans. They also conflicted with the study by Kazan and Uludağ (2014), in which the researcher concluded that 76% of the risk ratio is attributed to real estate loans. It also contradicted the study by Abu Rujaila and Srouji (2013), in which the researcher indicated that the default rate on consumer loans is lower than the default rate on investment loans.

We somewhat agreed with the study by Gichuhi and Omagwa (2020), which indicated that loan diversification has an impact on performance, such that changes in diversification affect performance, and increasing diversification improves the performance of the credit portfolio, while reducing it negatively affects performance. The study also aligned with the research of Al-Thaher et al. (2007), which was conducted in the same sector. The researcher mentioned that a high percentage of loans granted by lending institutions for productive projects are used for other consumer purposes, which is one of the reasons for their default.

Regarding the decrease in the PAR ratio for productive sectors and the housing improvement sector, this is related to the positive impact of these loans on borrowers by improving their income sources or providing a new income source if the loan is granted for a new project. They also contribute to providing housing, which is a necessity of life, and help borrowers reduce the rent expenses they pay, replacing this expense with a payment for a loan in exchange for a home that they will own in the end.

Despite the similarity in results related to the housing sector and the productive sector, the slight increase in risks for the productive sector compared to housing loans may be due to the reliance on studying the financial data of these projects when granting project loans. This data largely depends on estimation, as most small and medium-sized projects lack audited financial data. It is also related to the specificity of the Palestinian situation and the successive crises that this sector undergoes. However, despite the crises, the risk results appear acceptable and less sensitive compared to consumer loans. On the other hand, housing loans rely on proven income sources and may include fixed salaries, and the guarantees on them are also tightened more than those on project loans.

The differences in the results of some studies related to the quality index are due to the differing study populations and the varying study tools. This study used real data from lending institutions, and the results were built based on this data.

### 5.2.2 Sector growth rates

When aggregating the growth averages for the funded sectors, we notice that the consumer sector achieved the highest growth rate during the years 2021-2024 compared to the production sector and the housing sector, reaching 168.82% in the consumer sector, followed by the housing sector at 69.66%, and then the production sector at 67.89%. We observe that the growth in the consumer sector was concentrated in the years 2020 and 2021 and began to decline during the years 2023 and 2024.

Looking at the average growth rates in the sub-productive sectors, we notice that the highest growth rate is in the services sector at 126.15%, followed by the industrial sector at 105.9%, then the agricultural and commercial sectors at 99.5% and 91.5% respectively. The tourism sector recorded a decline in growth by 5.16%.

The study of Abu Rujaila and Srouji (2013) indicated that the consumer sectors were increasing during the period between 2008-2012, and their percentage reached 81%.

The researchers believe that the high growth rate of the consumer sector compared to other sectors is due to the fact that the portfolio of consumer loans is small compared to the portfolios of the production and housing sectors. The smaller the credit portfolio, the greater the potential for growth within it. In large portfolios, a significant portion of the loans issued



covers the decline resulting from loan re-payments, and the remaining part generates growth.

Although the growth rate of consumer loans is higher than the growth rate of the productive and housing sectors, when comparing this to the share of consumer loans from the total active portfolio during the years (2020-2024), we notice that it has decreased.

## 6. Conclusions

While studying the problem, we reached the following conclusions:

Firstly, the necessity of focusing on loans to productive sectors in their various branches and increasing their proportion in the overall portfolio to the highest possible percentage, as the primary goal of lending institutions is developmental in nature, and maintaining this ratio without a decline in the coming years.

Secondly, continuous training for credit staff in lending institutions regarding the study of productive loans, and the preparation of financial statements that reflect their status, performance, and cash flows, which help in making sound credit decisions that reduce risks, and enhancing training programs for entrepreneurs regarding bookkeeping, financial statement preparation, and analysis.

Thirdly, the necessity of maintaining a low percentage of consumer loans and tightening monitoring and collection procedures for them due to their high risks, and limiting them to loans for education, health, and basic needs.

Fourthly, despite the low risks of the housing sector and its importance in providing housing for Palestinian families, its proportion should not exceed that of the productive sector, as is the case in some institutions, in order to ensure that the institutions do not deviate from their developmental mission.

Fifthly, diversify the loan portfolio deals with risk. To limit risk, institutions must diversify their portfolio, prioritizing a balanced allocation between productive and non-productive loans.

Sixthly, it is necessary to utilize forecasting instruments by using time series forecasting and regression models, lending institutions may more accurately anticipate future risk patterns and modify their policies appropriately.

And seventhly, formulate customized strategies for unstable regions: Institutions must customize their risk management approaches for areas facing political or economic volatility to protect the loan portfolio and mitigate default rates.

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