| RESEARCH ARTICLE

Income Diversification and Profitability in Selected Latin American Countries

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| ABSTRACT

Due to global trends and increasing competition in the banking industry, banks are diversifying to non-intermediation activities. However, diversification of income may have implications for bank performance. We investigate the impact of bank income diversification on banks' profitability in Latin America. We take data from 7 Latin American nations (Argentina, Brazil, Chile, Colombia, México, Paraguay, Peru, and Venezuela) for the period of 2012-2022. Our results indicate that diversification improves bank profitability. Policymakers and bank managers should promote income diversification for the long-term sustainability of bank performance.

1.   Introduction

The banking industry is the foundation of any nation's health and the catalyst for its economic prosperity. The efficacy and efficiency of a bank's operations, as demonstrated by metrics like earnings, managerial effectiveness, and efficiency measurements, are called bank performance. Jara-Bertin et al. (2014) It affects the general stability of the banking industry and is a key factor in estimating the probability of bank collapses. (Hommes, 2021) An increasing body of research has examined the factors influencing bank performance, revealing the important effects of macroeconomic, industry-specific, and bank-specific factors. Recent studies also look at how institutional and sociopolitical issues affect bank performance. However, non-traditional operations have emerged as a significant element influencing bank performance and risk-taking and an additional source of bank profits since the information and communication technology (ICT) revolution of the mid-1990s.

Despite many empirical and theoretical debates recorded in the literature on economics and finance, the impact of revenue diversification on bank performance is still being extensively studied. Li et al. (2021) discovered that noninterest revenue streams have an inverse relationship with risk but a positive relationship with bank performance. Also, Adem (2022) finds that the income diversification strategy may enhance banks' financial stability during regular and emergency times. This is in line with the theory of portfolio management, which emphasizes creating a diversified portfolio by combining assets with various risk characteristics to minimize risk or maximize reward (Awerbuch et al., 2008). A contrasting viewpoint is presented by Ashraf and Nazir (2023), who find that excessive risk-taking caused by income diversification compromises bank stability.

The current study looks at the relationship between bank performance and revenue diversification. Most of the studies regarding this topic have been based on developed nations or non-financial industries, and a research gap exists for developing countries. As presidential power increased and administrations circumvented established protocols to expedite public spending on economic and health crises, corruption has skyrocketed in Latin America during the COVID-19 pandemic (Liu, 2022). We use data from seven

Latin American countries to investigate these links, in contrast to research that looked at the separate effects of corruption and income diversification on banks' performance in other regions.

2. Literature review

In banking literature, the key thesis is that diversification tends to lower bank risk and boost performance. Product variety often lowers the risk of loan failure. If the various income components are not perfectly correlated, this technique increases the diversification of income sources, which could aid banks in lowering risks and stabilising earnings. (Nguyen, 2019) On the other hand, legislators, industry professionals, and scholars are gravely concerned about the financial crisis and whether aggressive diversification tactics may have exposed certain institutions to significantly higher risk rather than lower risk. (Duho et al., 2019) As a result, different studies have different perspectives and findings regarding income diversity. The U.S. market and other developed economies serve as the foundation for most of these studies, and a negative relationship between bank diversification and performance is found in these countries. According to Baele et al. (2007), European banks' franchise values from 1989 to 2004 are positively impacted by a more significant percentage of non-interest income. However, their findings offer a divergent perspective on the connection between risk and diversification. According to the authors, banks' systematic risk rises when their revenue streams from various financial operations are diversified.

Little has been discussed about how non-traditional banking practices affect the stability and performance of banks in developing nations. Sharma and Anand (2018) investigate how income diversification affects bank performance in the BRICS nations as a structural reaction to concentration risk. From 2001 to 2015, 169 BRICS banks have been chosen from an unbalanced panel data set. The findings show that diversity and performance, as assessed by bank risk and returns, are positively correlated for medium- and large-sized banks. A study by Githaiga (2020) reveals that although the direction of the causal relationship differs, revenue diversification and human capital considerably impact bank performance. Income diversification has a negative impact, but human capital has a positive one in East African banks. Edirisuriya et al. (2018) examine the impact of income and asset diversification initiatives throughout the 2000–2016 timeframe using data from five countries: India, Bangladesh, Nepal, Pakistan, and Sri Lanka. Bank risk was found to be significantly positively impacted by non-interest-bearing assets and government loans in terms of revenue diversification. Still, mortgage loans and non-classified loans had the opposite effect.

Income diversification in emerging economies may offer unique and intriguing viewpoints compared with developed markets. Therefore, the following hypothesis regarding the impact of revenue diversification towards revenue streams not based on interest as a source of profits on banks' financial performance is put forth.

H1: Income diversification will positively affect the financial performance of Latin American banks

3. Data and Research Methodology

For 2013–2022, we employ macroeconomic, sociopolitical, and annual bank-level data to examine the influence of bank performance and income diversification. Our sample comprises 85 banks from 7 Latin American nations (Argentina, Brazil, Chile, Colombia, México, Paraguay, Peru, and Venezuela). We use the SNL Financial Institutions and Bank database for bank data, while macroeconomic data is taken from the World Bank database.

This research employs the Herfindahl-Hirschman-index (HHI) as the income diversification measure widely utilised in baking literature. The following is the HHI measure of income diversification (DV):

$$DV_{bct} = 1 - FCS_{ijt} \qquad (1)$$

DV_{bct} gives the revenue diversification of bank b in nation c at time t. A greater DV_{bct} value indicates more diversified (less focused) banks, while a smaller value indicates less diversified banks. Here, FCS stands for the indicator FOCUS, which is calculated by the following equation:

$$FCS_{bct} = (NONinc/NPI)^2 + (INTinc/NPI)^2 \qquad (2)$$

Here, interest income (INTinc) and non-interest income (NONinc) combine to form net operating income (NPI). The degree of bank NPI concentration is estimated here using FCS and non-interest income. We use two performance metrics for banks, which are based on banking literature: return on equity (ROE), return on assets (ROA), and return on equity (ROE). Due to the variations in tax laws among the nations in the sample, the profit before tax is employed in this study to calculate both ROA and ROE. The ratio of net income before taxes to assets is used to calculate ROA, and the ratio of net income before taxes to equity is used to calculate ROE. We calculated the ROE and ROA standard deviations.

Following previous research, we include controls at the bank and national levels in our analysis. The following bank-level controls are included: capital ratio (CR), which is the ratio of capital funds to total assets; bank size (SZ), which is the natural logarithm of

total assets; operating cost (OC), which is the ratio of operating expenses to total assets. Our study includes country-level controls for GDP growth (as determined by annual GDP growth rates), inflation rate (INFL), and business environment (as determined by the log of the EBI).

To understand the impact of revenue diversification on the performance of a bank, our baseline equation is as follows:

$$\pi_{bct}=\beta_0 + \beta_1 COR_{ct} + \beta_2 DV_{bct} + \beta_3 NIR_{bct} + \beta_\phi Y_{bct} + \beta_\gamma C_{ct} + \mu_c + \lambda_t + \varepsilon_{bct} \qquad (3)$$

where π is the financial performance indicator (as determined by ROA and ROE), and b denotes the bank in nation c in year t; bank-level controls are denoted by Y, country controls by C, and the country effect, year effect, and error term by μ_t, λ_t, and ε_{bct}, respectively. DV is based on the HHI measure defined and explained previously, which is modelled on the two components of total operating income (interest and non-interest income); NIR is the ratio of non-interest income to total net operating income,

To address the problem of the baseline model's reversible relationship between bank restrictions, performance, and diversification, we look at a dynamic model utilising the Generalised Method of Moment (GMM). According to Lu and Wooldridge (2019), the two-step GMM approach is far more reliable and effective at estimating the models' coefficients and resolving endogeneity, heteroscedasticity, and autocorrelation issues. Our basic model's modified form is described as follows:

$$\pi_{bct}=\beta_0 + \beta_1 \pi_{bct-1} + \beta_2 DV_{bct} + \beta_3 NIR_{bct} + \beta_4 COR_{ct} + \beta_\phi Y_{bct} + \beta_\gamma C_{ct} + \mu_j + \lambda_t + \varepsilon_{bct} \qquad (4)$$

4. Results

Table 1 shows the descriptive statistics of every bank variable study. According to these statistics, banks in Latin American nations have an average degree of income diversification (DV) of 0.279. Their average operating cost is 5.7%.

Table 1: Descriptive Statistics

	DV	NIR	CR	OC	SZ	ROA	ROE
Mean	0.279	0.408	0.178	0.057	13.247	0.014	0.181
Std. Dev.	1.426	0.212	0.121	0.09	1.737	0.572	0.565
Min	0.149	0.000	0.008	0.003	8.149	-28.301	-18.446
Max	0.715	1.001	1.359	0.928	18.652	0.573	11.702

This section presents the estimations' findings on how income diversification affects the pooled sample's performance metrics. ROA and ROE are the dependent variables in Table 2, which displays the regression findings for the sample. We utilise NIR separately in regressions for a robustness check because there may be collinearity between DV and NIR. We estimate the regression findings using OLS as the benchmark and the dynamic model, the GMM, which accounts for the DV's rigidity. Because it identifies autocorrelation in our model, the AR (2) test is crucial for GMM estimations. The reported AR (2) values attest to the models' lack of serial autocorrelation issues. Additionally, the variables employed as instruments in the model can be validated using the Sargan-Hansen (SH) test of over-identifying limitations. The joint hypothesis that the over-identifying limitations are legitimate cannot be rejected, according to the SH p-values shown in Table 2. We can, therefore, say that the internal instruments are legitimate.

Hypothesis 1 is supported by the regression results in Table 2, which demonstrate that banks and risk-adjusted profits increase when interest revenue is replaced by non-interest income. In line with the findings of Vidyarthi, H. (2019) and Khresna et al. (2018), who highlighted that revenue diversification enhances the performance of banks in Malaysia and India, respectively, DV and NIR are positive and significantly correlated with bank performance. Our study's conclusions are crucial in terms of economic relevance. For example, if the mean of ROA is 0.013, a single standard deviation increase in NIR (0.211) will boost ROA by 3%, whereas if the mean value of ROE is 0.180, ROE will increase by 0.7%. This suggests that banks in Latin America perform better financially when they diversify into non-interest income sources. This demands that bank management and shareholders throughout Latin America pay attention to the necessity of investing in various revenue-generating ventures.

Table 2: Impact of Income Diversification on Performance

According bank-level the

to our controls,

	Ordinary Least Squares		Two-step Generalised Method of Moment	
	(1)	(2)	(3)	(4)
	ROA	ROE	ROA	ROE
t -1			0.152***	0.326***
			(0.042)	(0.048)
DV	0.005***	0.014**	0.007**	0.018*
	(0.001)	(0.006)	(0.004)	(0.007)
NIR	0.016***	0.063***	0.022***	0.031**
	(0.001)	(0.012)	(0.010)	(0.014)
CR	0.044***	0.032*	0.088***	0.084
	(0.003)	(0.011)	(0.027)	(0.154)
SZ	0.010**	0.023***	0.003**	0.007**
	(0.001)	(0.003)	(0.002)	(0.004)
OC	-0.025**	-0.174*	-0.267***	-0.250**
	(0.011)	(0.091)	(0.096)	(0.110)
INFL	0.000***	0.003***	0.000**	0.002***
	(0.000)	(0.002)	(0.000)	(0.001)
GDP	0.000	0.002	0.000	0.000
	(0.000)	(0.001)	(0.000)	(0.001)
Constant	0.031***	0.045	0.000	0.000
	(0.009)	(0.073)	(0.000)	(0.000)
Bank type dummies	Yes	Yes	Yes	Yes
Country effect	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes
AR (2)			0.522	0.351
SH p -value			0.229	0.101
Observations	678	678	543	524

performance of banks is significantly impacted by capital adequacy (CR), bank size (SZ), and operating cost (OC). The findings indicate a strong positive correlation between CR and financial performance metrics, which may indicate that banks' financial performance is supported by more outstanding capital as they expand into new industries. Banks with high operational costs per unit of income indicate inefficient management. Regarding our macro-level controls, it is discovered that inflation significantly improves both performance metrics. This effect is also highlighted in the study of Indian banks by Maria & Hussain (2023).

5. Conclusion

There is little evidence on how income diversification affects bank performance in Latin America, even though the performance implications of bank income diversification have been extensively researched in the developed parts of the world. We fill this research gap using 10-year data for 85 banks from seven Latin American nations and the Generalised Method of Moment (GMM) as the primary estimation technique. The findings of the study show that revenue diversification increases banks' profits and risk-adjusted earnings.

The overall outcome is consistent with portfolio theory, which holds that income diversification helps enhance financial stability and reduce risk in emerging and developing nations. According to another analysis, there is a quadratic relationship between bank diversity and financial stability, and diversification enhances financial stability during crises and beyond. (Adem, 2022) However,

over-diversification above the predicted ideal point, according to numerous research studies, exposes banks to instability during crises and noncrises. (Vidyarthi, 2019)

The findings have ramifications for macroeconomics, administration, academic environments, and legislative frameworks. To ensure high stability, banks must emphasise cost-effective diversification strategies and improve management competency when growing noninterest revenue businesses. To prevent banks from becoming overly diversified, authorities should also promote sensible diversification in emerging and developing nations. Banks ought to invest in liquidity management to optimise the benefits of liquidity. To balance their financing expenses against their interest income, banks must manage their deposits and liquidity and consider and modify their loan rates. The regulating body will promote favourable fiscal, institutional, and economic conditions.

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