The Impact of Indirect Competition on Bank Net Interest Margins: Microfinance Evidence from Pakistan

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ARTICLE INFO

ABSTRACT

The study aims to investigate the impact of growth in microfinance initiatives on the net interest margins of commercial banks in Pakistan. Using data from the world bank MIX database and Thomson Reuters, we conducted a GLS random effect estimation on an unbalanced panel of Pakistani banks from 2010 to 2018. We find that credit quality, solvency, bank size, earning asset diversification, and market concentration impact banks' net interest margins. In addition, we find growth in development finance institutions to significantly affects commercial bank margins. Microfinance institutional growth is found to reduce net interest margins. Besides microfinance institutions, the growth of specialised microfinance banks is also found to impact the spread negatively. This indirect effect may be evidence of the improved efficiency derived from higher competition or the fact that microfinance institutions may be using conventional banks as a permanent source of funds to become financially sustainable. The role of microfinance growth is not considered in literature since microfinance institutions are very different from conventional banks regarding lending volume and size. This study contributes to the existing theoretical and empirical literature on net interest margins by showing a positive role of indirect competition on banks' net interest margins. Therefore, policymaking focusing on improving conditions that enhance competition to bring bank spreads closer to regional levels may be needed.

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1.   Introduction

As emerging markets struggle with improving financial inclusion, the developed markets have witnessed the emergence of non-bank solution providers specialising in customised products tailored to meet the financial needs of people, as was predicted by (Thakor 1999). However, in South Asia, financial inclusion is still comparably low compared to the world average. As a result, microfinance institutions (MFIs) have emerged to fill up the space left open by banks.

Over the last decade, Microfinance institutions have been a global success story, with over 7000 MFIs working towards improving financial inclusion and outreach. The potential is vast, and there is constant pressure to expand. MFIs can easily become financially sustainable by not focusing on their primary goal of serving the poorest. By targeting people who are better

off and making larger loans, they can increase their profits and face lower losses. It is hypothesised that this would bring them in competition with conventional banks if this were to happen. This competition would lead to the squeezing of profit margins for banks.

MFIs and MFBs have experienced mushroom growth in south Asia. Additionally, these microfinance institutions are infamous for charging high interest on loans and enjoying handsome spreads (Tubastuvi & Pratama, 2020). Increased screening costs and lack of collateral of the target group are a few reasons for such high spreads. Another argument for such high spreads is their funding sources which should rely mainly on aid and government subsidies, has become more dependent on commercial banks. Shkodra (2019) analysed MFI spreads and found a significant role of high-interest rates on bank loans.

Net interest margin is the difference between the banks' income and expenses as a ratio of its total assets. It closely resembles the bank spread, which is the difference between the lending and deposit rates. The dealership model of Ho and Saunders (1981) is the underpinning theory behind the theory on determinants of net interest margins. It states that pure spread is derived from interest rate elasticity, banks' risk management, and transaction size. Researchers have extended the theory to include portfolio effects, regulatory factors, credit risk, operating expense, market concentration and default probability as factors determining the bank net interest margin(Allen, 1988; Angbazo, 1997; Demirgüç-Kunt & Huizinga, 1999; Maudos & Fernández de Guevara, 2004). In addition, studies suggest that net interest margins are lower in countries with higher financial inclusion. Bank spreads are generally higher in emerging economies than in the developed world. More options and competition within banks for clients and sources of funds for their operations encourage competitive interest rates(Claeys & Vander Vennet, 2008).

South Asia relies heavily on microfinance institutes, banks and NGOs to reach out to and cater to the financing needs of the cottage industry and SME sector. As recent as 2009, commercial banks had been catering to the cottage and SME sectors. However, the last decade has seen rapid growth in Microfinance institutes, NGOs and specialised banks. Although growing above regional averages, internet usage is still one of the lowest in Pakistan, and MFIs use SMS services and the internet to expand their customer base. Interestingly, digital payments made or received doubled between 2014-2017. Although the internet and online services have improved, financial inclusion in Pakistan is still one of the lowest in South Asia (Nenova & Niang, 2009) due to high intermediation costs, spreads and collateral requirements.

Contemporary literature suggests that MFIs are not in direct competition with the commercial banks since their target market is the lowest segment of the income bracket, they cater to a substantial population who can add to the bank's deposit if not recipients of banks loans. Countries like Pakistan have large unbanked populations providing potentially large markets. Over the last decade, fintech initiatives targeting the unbanked have increased with companies offering mobile solutions like banking apps, mobile wallets, web applications for personal finance, e-payment processing, payment solutions, social investment networks, management consulting, technology and outsourcing services. Microfinance Institutions (MFIs) and Microfinance Banks (MFB) are the major clients of these fintech companies. In addition, the State bank of Pakistan has eased its regulations for branchless branching to target the unbanked segment. This shows its intent towards fulfilling the "microfinance promise" which is reaching out to the poor while maintaining financially sustainable (Morduch, 1999). Interestingly enough conventional banks of South Asia have comparatively higher margins than the West. Traditional MFI funding sources are NGOs and government subsidies. However, MFIs have strayed from their primary role of fulfilling the "microfinance promise" and reaching out to the poor and shifting to a more profit-driven orientation to ensure financial sustainability.

The impact of interbank concentration and competition has been extensively studied in the literature, and there are contradictory views and evidence available in this regard. For example, higher concentrations and lower competition should allow banks to charge higher interest rates on loans and lower deposits (Naceur, 2003). Therefore banking systems with high concentration should have higher interest margins. On the other hand, the contradictory view suggests higher monitoring costs in diffused banking systems induce higher bank spreads(De Haan & Poghosyan, 2012).

Demirgüç-Kunt and Huizinga (1999) test for the determinants on net interest margin and find that bank spread increases when there is less competition, even when the concentrations are high. This is attributed to the structure conduct hypothesis, where higher concentrations result in less competitiveness and collusion in rate-setting. However, there is contradictory evidence against big banks exerting their market power resulting in high margins, while some do not find a role in market concentration on the setting of interest rate margins (Agoraki & Kouretas, 2019; Carbó Valverde & Rodríguez Fernández, 2007; Naceur, 2003). In addition to this, the impact of indirect competition has not been explored extensively in the literature.

Traditionally microfinance institutions have not been considered competition for conventional banks due to the difference in volume and size of transactions. This is changing with conventional banks exploring digital technologies and avenues to engage the micro level customers. In addition to that, contemporary literature suggests MFI's shifting from their primary role. Have the net interest margins of conventional banks been affected by growth in Microfinance institutions and microfinance banks?

Microfinance institutions primarily exist to improve access to the unbanked population in smaller denominations and elevate poverty. However, attaining this goal while remaining financially sustainable at the same time is a challenge. According to DD'Espallier and Szafarz (2013), in 2010, only one-fourth of all MFIs were using subsidies. Recent studies find exploitatively high net interest margins in Bangladesh, India and Pakistan. These MFIs have been approaching conventional banks as a fund source and charging the poor interest rates as high as 35% to stay financially sustainable.

Are microfinance institutions overly reliant on conventional banks as a source of funds and passing it on to their customers? Has the growth of microfinance impacted conventional banks for the better or worse? What impact does competition and concentration in the banking industry have on banks' net interest margins? These are all question that have not fully understood in literature.

We investigate this phenomenon by checking how growth in microfinance institutions and banks has impacted conventional bank spreads. This paper extends the extensive literature on commercial bank net interest margin determinants by investigating the effect of microfinance growth on commercial bank margins as is predicted in (Thakor, 220). Using Pakistan banks as a test case, we investigate how the expansion of Microfinance institutes and microfinance banks has impacted conventional banks' net interest margins over the past ten years. Pakistan is a good case because its bank sector has not experienced a major expansion in the number of new banks and has been enjoying high profitability and large spreads (Khan & Jalil, 2020). Secondly, its microfinance sector has experienced a mushroom growth, with active borrowers increasing from 2.4 million in 2013 to 6.9 million in 2018, according to microwatch reports. Therefore, Pakistan is a good test case to see how net interest margins are impacted by increasing microfinance institutions when the increase in direct competition from conventional competitors is relatively similar.

2.   Literature Review

Almost all studies on bank interest margins are grounded in the two-step dealer model (Ho & Saunders, 1981). The model represents the bank as a risk-averse dealer, maximising its wealth by supplying loans and funding deposits. The model describes the net bank spread determined by the margins on loans and deposits. Factors that affect the spread include the banks' level of risk aversion, the variance of deposit and lending rates, the size of bank transactions and their market powers. The banks set their interest rates to cater to the uncertainty in the market of demand and supply of funds (Maudos & Fernández de Guevara, 2004).

The dealership model has been extensively tested and extended further to include operating costs, management quality, operating expense, term structures, level of competition and the impact of financial liberalisation (Barajas, Steiner, & Salazar, 2000; Hanweck & Ryu, 2011; Juttner & Gischer, 2003; Maudos & Fernández de Guevara, 2004). In addition, Demirgüç-Kunt and Huizinga (1999) in analysing eight developing and industrial countries, found that tax rates and the degree of international ownership also positively impacted bank spreads.

Leykun (2016) suggests that the degree of competition (Lerner index) also plays a significant role as a determinant of bank spread. The results study results also suggest concentration led to lower competition and increasing interest margins of banks, especially the dominant bank like CBE in the case of Ethiopia. Ugur and Erkus (2010) find that market share and management quality reduce bank spreads, which operating costs, size, and risk aversion increases bank spreads. Additionally, they find that the type of banks also impacts their spreads, with foreign banks earning higher spreads.

Multiple studies suggest a positive role of deposit insurance premiums and capital requirements on net interest margins (Addai, Gyimah, & Lartey, 2016; Gounder & Sharma, 2012; Nassar, Martinez, & Pineda, 2017). Nguyen et al. (2020) find that excess liquidity reduces monetary policy effectiveness and negatively impacts lending rates. Ltaifa (2018) find that financial development also affects net interest margins. Higher inflation is also seen to impact net interest margins positively. Busch and Memmel (2017) interestingly enough show that in the short run, higher interest rates decrease net interest margins while they increase the spread in the long run.

Contemporary literature attributes multiple bank-specific and macroeconomic factors that impact bank spreads. Size of the banks, their leverage, operational costs, profitability, liquidity and ownership structures are all factors that have been identified in the literature to impact bank spreads (Agoraki & Kouretas, 2019). Their impact, however, is contradictory in literature with large cross country differences. Larger banks may exert market power and demand higher interest rates. It is therefore hypothesised that bank size should positively impact net interest. In analysing banks of south Asia, Islam and Nishiyama (2016) find a negative impact of bank size on bank net interest margins. However, Iloska (2014) don't find an impact of bank size and risk aversion on bank net interest margins. Similarly, Al-Harbi (2019) also doesn't find any bank size effect on bank spreads.

The capital ratios are used to proxy solvency risk and degree of risk aversion in literature and are hypothesised to impact net interest margins positively since higher capital level may result in lower costs of funds (Angbazo, 1997; Zhou & Wong, 2008). A positive relationship exists between capital requirements and net interest margins (Cruz-García & Fernández de Guevara, 2020).

Credit quality is proxied using the nonperforming loans ratio. It is the bank failing to fulfil its agreed contracts on loans leading to loss of cash flow, principal and interest. A higher level of credit risk leads to a higher cost of borrowing. Nonperforming loans as a ratio of total assets are used to proxy credit risk (Maudos & Fernández de Guevara, 2004). Credit risk is positively and significantly linked to bank net interest margin (Bektas, 2014). Trinugroho et al. (2013), however, find a negative impact of credit risk and cost to income ratio on bank spreads. Bashir (2021)also find a negative impact of credit risk and leverages on bank spreads. Higher credit risk is hypothesised to cause banks to charge higher interest rates, resulting in higher net interest margins.

Higher lending ratios are hypothesised to reduce interest rates. However, Lestari et al. (2021) find no impact of lending on bank spread, whereas bank diversification, liquidity, size and efficiency of management impact. Khalil and Farooq (2019) find a positive impact of management efficiency on net interest margins in south Asian countries, whereas leverage and credit risk negatively impact bank spreads. Therefore, higher interest rates are hypothesised to increase net interest margins. In addition, better management quality is suggested to increase net interest margins (Khalil & Farooq, 2019; Zhou & Wong, 2008).

Herfindahl-Hirschman Index (HHI) represents the industry concentration. There are contrasting views on its impact on bank spreads. Banking systems with high bank concentration may result in higher net interest margins due to their ability to influence the interest rates (Naceur, 2003). On the other hand, lower monitoring costs in a highly concentrated industry may negatively impact (De Haan & Poghosyan, 2012). Hoang Trung and Vu Thi Dan (2015) analyse spread determinants in Vietnam and find that bank concentration decreases bank spreads, while inflation, risk aversion and management quality positively impact net interest margins.

The impact of economic growth on bank spread is also contradictory (Carbó Valverde & Rodríguez Fernández, 2007). Egly et al. (2018) suggest a positive impact on bank spreads, while others don't find any evidence of GDP impacting net interest margin(Hoang Trung & Vu Thi Dan, 2015). Business cycles have been identified to impact bank spreads with conflicting empirical evidence. In studying the 2008 global financial crisis, some studies suggest an inverse relationship(Alharthi, 2017; Caprio, D'Apice, Ferri, & Puopolo, 2014; Dumicic & Rizdak, 2013; Lee, Growe, DeBruine, & Cha, 2015). Other studies find a direct or no impact at all(Hoang Trung & Vu Thi Dan, 2015a; Obeidat, Khataibeh, Omet, & Tarawneh, 2021; Rachdi, 2013). Most empirical studies suggest an inverse relationship between inflation rates and bank spreads (López-Espinosa, Moreno, & Pérez de Gracia, 2011; Moussa & Majouj, 2016; Tarus, Chekol, & Mutwol, 2012). Regulatory frameworks and supervisory control in banking sectors also influence bank spreads.(Azeez & Gamage, 2013; Pan & Mishra, 2018; Sensarma & Ghosh, 2004; Zhou & Wong, 2008)

Social and financial stability measures have been used in literature to understand MFI performance. For example, Cuéllar-Fernández et al. (2016) tested the HO model for microfinance institutions and found that higher financial inclusion would decrease the net interest margins of MFIs. Additionally, operating costs were a significant factor in determining the spread of MFIs. Shkodra (2019), in ananalysingFI spreads, found a considerable role in the high-interest rates of bank loans.

Most microfinance institutions are financial-sustainability minded. The trade-off now exists between financial stability and meeting their social agendas (Morduch, 1999). Net interest margin (NIM) is similar to the banks' interest spread except that NIM considers the difference in the volume on loans and deposits of banks (Brock & Rojas Suarez, 2000). Positive values suggest

that the MFI or bank can cover its financing costs, while a negative value suggests otherwise, with expenses exceeding earnings.

The impact of interbank concentration and competition has been extensively studied in the literature, and there are contradictory views and evidence available in this regard. When some banks are larger than the rest, they may exert market power in interest rate settings and lead to higher interest margins. Therefore higher concentrations and competition should allow banks to charge a higher interest rate on loans and lower deposits (Naceur, 2003). Hanzlík and Teplý (2019) find evidence for higher spreads in more concentrated banking systems. Sensarma and Ghosh (2004) suggest that more competitive banking sectors have smaller spreads and level of development impacts spread as well. Hamadi and Awdeh (2012) suggest that net interest margins show a decreasing trend over time. The contradictory view suggests higher monitoring costs in diffused banking systems induce higher bank spreads(De Haan & Poghosyan, 2012). Cruz-García and Fernández de Guevara (2020), in their cross-country study, found that higher operating costs and efficiency and competition increase net interest margins.

Similarly, the literature suggests that young firms obtain loans at lower rates in more concentrated markets due to their higher access to credit. The literature suggests that banks provide more financing in markets with higher concentrations. Empirical evidence also suggests an increase in relationship banking when concentrations increase (Degryse & Ongena, 2008). Demirgüç-Kunt and Huizinga (1999) find evidence of large banks exercising market power in interest rate setting. This is attributed to the structure conduct hypothesis, where higher concentrations result in less competitiveness and collusion in rate settings. The relationship between high concentrations and net interest margins is moderated by the level of competitiveness in the banking system. The impact of indirect competition has not been explored in literature so far, and this study aims to fill this gap.

3.   Methodology

The econometric model is as follows and is estimated using the random effect estimation.

$$NIM_{it} = CapitalRatio_{it} + CreditQuality_{it} + Interest\ Income\ to\ Loans_{it} + Liquidity\ Ratio_{it} + Bank\ Size_{it} + OffBSIncomeRatio_{it} + HHI_t + Microfinance\ Proxy_t + \mu_{it} \tag{1}$$

The dependent variable is net interest margin for bank' i' at time 't'. Net interest margin is the difference between the bank's income and expenses as a ratio of its total assets. It closely resembles the bank spread, which is the difference between the lending and deposit rates. Equation 1 shows the function form of the determinants net interest margin derived from the (Ho & Saunders, 1981). Net interest margin has been calculated by the proxy that has been taken from the paper of (Kasman, Tunc, Vardar, & Okan, 2010).

The capital ratio is calculated by dividing total equity by the total assets. It proxies solvency risk and is hypothesised to impact net interest margins positively (Angbazo, 1997). Zhou and Wong (2008) use the definition for proxying degree of risk aversion. Credit quality is proxied using the nonperforming loans ratio. Credit risk is the bank failing to fulfil its agreed contracts on loans leading to loss of cash flow, principal and interest. A higher level of credit risk leads a to higher cost of borrowing. Nonperforming ratio of total assets is used to proxy credit risk (Maudos & Fernández de Guevara, 2004). Credit risk is positively and significantly linked to bank net interest margin (Bektas, 2014). Interest income to loan ratio proxies returns on earning assets. Therefore, higher interest rates are hypothesised to increase net interest margins. Bank size is the log of total assets. Larger banks may exert market power and demand higher interest rates. It is therefore hypothesised that bank size should positively impact net interest. The

liquidity ratio is the total loan to total deposit ratio. "OffBSIncomeRatio" is the noninterest income as a ratio of total assets.

Herfindahl-Hirschman Index (HHI) represents the industry concentration. There are contrasting views on its impact on bank spreads. For example, banking systems with high bank concentration may result in higher net interest margins due to their ability to influence the interest rates (Naceur, 2003). On the other hand, lower monitoring costs in a more concentrated industry may negatively impact margins (De Haan & Poghosyan, 2012).

The variable of interest of the study is the Microfinance growth proxy, which is proxied using the total assets of all microfinance institutions, the total assets of all microfinance banks and growth rates of both.

The data of conventional banks are taken from the Thomson Reuters database of all listed conventional Pakistani banks from 2010 to 2020. The microfinance institution data and Microfinance banks are taken from the State Bank of Pakistan website, World Bank MIX database and the Pakistan microfinance network database. The data set is winsorised at 1% of the tail, resulting in an unbalanced panel.

Table 1
Descriptive Summary

Variable	Formula	Obs	Mean	Std. Dev.	Min	Max
Spread	NIM	234	0.032	0.014	-0.016	0.091
Solvency Ratio	EtoA	234	0.124	0.081	-0.03	0.505
Credit Quality	NPL Ratio	196	0.06	0.068	0.004	0.659
Interest Income to Loans	Interest Income to Loans	235	0.194	0.056	0.075	0.453
Liquidity Ratio	Loans to Deposit Ratio	235	0.58	0.154	0.254	1.018
Bank Size	Log(Total Assets)	234	19.445	2.186	8.061	22.071
Diversification Ratio	Noninterest Income Ratio	234	0.01	0.021	-0.107	0.046
Log (MFI Assets)	Log (MFI Assets)	256	23.517	0.789	22.365	24.697
MFI Asset Growth	MFI Asset Growth	224	0.014	0.006	0.007	0.024
Log (MFB Assets)	Log (MFB Assets)	288	18.218	0.881	16.873	19.604
MFB Asset Growth	MFB Asset Growth	256	0.019	0.006	0.01	0.03

The descriptive statistics can be seen in Table 1. The average bank spread is 3.2% which is lower than the regional average of 5%. The correlation matrix and variance inflation factor are shown in Tables 2 and 3 to check for multicollinearity.

Table 2
Correlation Matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) Solvency Ratio	1						
(2) Credit Quality	-0.145	1					
(3) Interest Income to Loans	0.11	-0.177	1				
(4) Liquidity Ratio	0.314	0.32	-0.584	1			
(5) Bank Size	-0.2	-0.355	0.086	-0.494	1		
(6) Diversification Ratio	0.176	-0.519	0.361	-0.419	0.553	1	
(7) Log (MFI Assets)	-0.038	-0.331	-0.31	-0.169	0.395	0.19	1

Variables are not highly correlated, and the variance inflation factor also suggests the absence of multicollinearity. Additionally, Whites' robust standard errors are reported to adjust for heteroskedasticity.

Table 3
VIFs

	VIF	1/VIF
Liquidity Ratio	3.13	0.319
Interest Income to Loans	2.73	0.367
Diversification Ratio	2.14	0.468
Bank Size	2.06	0.485
Log (MFI Assets)	1.7	0.589
Solvency Ratio	1.58	0.632
Credit Quality	1.54	0.651
Mean VIF	2.13	

4.   Results and Discussion

The study investigates the impact of direct and indirect competition on the net interest margins of conventional commercial banks. Opposing viewpoints are suggested in theory regarding the competition. One view suggests bank spreads decrease with higher concentration. The second suggests that bank spreads increase due to collusive interest rate settings.

To test the impact of concentration on net interest margins, four (04) models were tested. The Hershman Herfindahl Index measures the effect of concentration and direct completion on net interest margins for each model. Model 1 and model 2 use the log of total assets of microfinance the institutions and growth of MFI assets. Model 3 and 4 are estimated as a robustness check by using the assets of microfinance banks, which cater to a different stratum of the society, therefore not providing direct competition to conventional banks.

Table 4
Main Results of GLS estimation with robust standard errors

	Model 1		Model 2	
	Coef.	(Rob. Std.Err)	Coef.	(Rob. Std. Err)
Constant	0.087*	(0.047)	-0.030	(0.029)
Bank Specific Variables				
Solvency Ratio	0.028	(0.025)	-0.003	(0.021)
Credit Quality	-0.033	(0.025)	-0.083**	(0.028)
Interest Income to Loans	0.081***	(0.022)	0.120***	(0.019)
Liquidity Ratio	0.021*	(0.011)	0.035***	(0.009)
Bank Size	0.002**	(0.001)	0.000	(0.001)
Diversification Ratio	0.262**	(0.097)	0.320**	(0.127)
Industry Specific Variables				
HHI	-0.412**	(0.159)	0.247	(0.197)
Macroeconomic variables				
Log (MFI Assets)	-0.004**	(0.002)		
MFI Asset Growth			-0.210**	(0.074)
Adj. R-squared	0.687		0.701	
N	146		127	

* p<.1, ** p<.05, *** p<.001

We find evidence of a significant negative impact of bank market concentration on the net interest margins on conventional banks in Pakistan. The traditional structure-conduct hypothesis suggests that collusion in interest rate setting leads to high net margins when a few banks contribute a large share of the total banking system. A significant negative result suggests the absence of collusion in interest rate settings in the bank industry. Similarly, banks with large market shares can use their power in the pricing of funds and lead to higher spreads. We find a significant positive impact of bank size on net interest margins consistent with the hypothesis

developed earlier. However, the size of the impact is very small. Yao et al. (2018), in analysing the profitability of Pakistan banks, find similar results. Model 2 checks for the robustness of the results by using the growth rate of microfinance assets on the net interest margins. The size of the impact is significantly larger and more prominent in this case. In investigating the profitability of Pakistani banks, Yao et al. (2018) also found a similar negative impact of concentration. Other studies that find similar results include (Agoraki & Kouretas, 2019; Carbó Valverde & Rodríguez Fernández, 2007; Cha, Hwang, & Gregor, 2014; Naceur, 2003)

We do not find any impact of capital to asset ratio on bank margins. Higher capital induces profitability and, therefore, larger margins. Previous studies have found a positive impact (Goddard, Molyneux, & Wilson, 2004; Tan & Floros, 2012; Yao et al., 2018). Credit quality has a significant positive impact on the net interest margin. Nonperforming loans impact the bank spread negatively.

In model 1, the impact of Credit quality is found to significantly negatively impact the net interest margins when the growth of MFIs is included in the model. Credit risk is the bank failing to fulfil its agreed contracts on loans leading to loss of cash flow, principal and interest. A higher level of credit risk leads to a higher cost of borrowing. In this study, the nonperforming loans as a ratio of total assets are used to proxy credit risk (Maudos & Fernández de Guevara, 2004). Bektas (2014) used the loan ratio to proxy credit risk and found a positive relationship with net interest margin. Higher interest rates are significantly positively related to higher interest rates.

Liquidity is also found to impact bank spreads positively. High values of this ratio suggest more lending than deposits and should cause a positive impact. The study uses the loans to deposit ratio to proxy liquidity. Higher values suggest higher profitability due to higher interest-bearing assets(Bourke, 1989; Trujillo-Ponce, 2013; Zarrouk, Ben Jedidia, & Moualhi, 2016)

Bank size is found to impact bank spreads positively. This relationship is consistent with the hypothesis that larger banks can exert market power and ask for higher interest rates resulting in higher spreads. This may also be due to their ability to diversify their portfolio of assets and reduce risk (Bourke, 1989)

The impact of income diversification on bank spread has mixed findings in the literature. Noninterest earning is found to negatively impact the net interest margins of Pakistani commercial banks consistent with (Jiang, Tang, Law, & Sze, 2008).

Table 5 reports the results of the same regression model, but microfinance banks are used instead of MFIs, in this case, to see if the indirect impact of concentration and competition holds or not by using a different proxy.

The model's explanatory power remains high, and our findings are robust. Model 3 checks for the growth of impact of microfinance banks on the net interest margins of conventional banks. The results are similar to that of model 1. Growth in microfinance banks is found to cause bank interest margins to decrease. The size of the log asset term is similar to that of microfinance institutions. However, in the case of microfinance bank growth, the impact is insignificant. Additionally, the impact of bank size also becomes insignificant in the case of model 4.

Microfinance banks have been experiencing similar growth in their assets as nonfinancial microfinance institutions. Model 4 tests for the impact of microfinance banks' asset growth. The impact of microfinance banks' asset growth in the net interest margins of conventional banks is insignificant.

Table 5
Robustness using the growth of Microfinance Banks

	Model 3		Model 4	
	Coef.	(Rob. Std.Err)	Coef.	(Rob. Std. Err)
Constant	0.060*	(0.034)	0.016	(0.027)
Bank Specific Variables				
Solvency Ratio	0.023	(0.021)	0.009	(0.015)
Credit Quality	-0.033	(0.026)	-0.075**	(0.030)
Interest Income to Loans	0.082***	(0.022)	0.119***	(0.021)
Liquidity Ratio	0.023**	(0.009)	0.030***	(0.008)
Bank Size	0.002*	(0.001)	-0.001	(0.001)
Diversification Ratio	0.281**	(0.099)	0.317**	(0.121)
Industry Specific Variables				
HHI	-0.423**	(0.158)	-0.071	(0.125)
Macroeconomic variables				
Log (MFB Assets)	-0.004**	(0.001)		
MFB Asset Growth			0.062	(0.056)
Adj. R-squared	0.673		0.647	
N	163		144	

Note: * p<.1, ** p<.05, *** p<.001

The microfinance market holds immense potential. Over the last five years, Pakistan has experienced an increase in conventional banks venturing into small and medium and micro-financing. The findings of our study suggest that growth in both microfinance institutions and banks have impacted the spreads of conventional commercial banks. This can be inferred from two perspectives. The findings could suggest that these intuitions have become competition for conventional banks. With the increase in the pool of sources of funds available to people, the net interest margins of conventional banks have fallen. Alternatively, it can also be interpreted as evidence that microfinance institutions are overly reliant on conventional banks as a source of funds and passing it on to their customers.

Positive net interest margins are desirable for banks, however, very high spreads are detrimental to economic growth (Carbó Valverde & Rodríguez Fernández, 2007). Our findings suggest that microfinance growth has a disciplining effect on conventional banks.

5.   Conclusion

In the paper, we analysed the determinants of the net interest margins of conventional commercial banks of Pakistan over ten years. Results suggest that microfinance institutions and banks both help discipline commercial banks in the net interest margins. We find evidence of indirect competition as a determinant of net interest margins. Microfinance institution growth negatively impacts conventional bank net interest margins. Besides microfinance institutions, the growth of microfinance banks is also found to impact growth negatively. This indirect effect may be evidence of the improved efficiency derived from higher competition or the fact that microfinance institutions may be using conventional banks as a permanent source of funds to become financially sustainable.

We have found that poor credit quality and competition negatively reduce bank margins. Interest income, liquidity, bank size, and earning source diversification positively impact conventional banks' net interest margins.

The study contributes to the existing body of knowledge in net interest margins by providing empirical evidence of the impact of microfinance sector growth on bank margins. The evidence suggests that growth in the microfinance sector negatively impacts the margins of

conventional banks. Banks need to diversify their portfolios to expand their customer base to stay competitive and liquid. The policymakers should allow the entry of more banks into the system to improve the country's financial inclusion and encourage higher competition, which would lead to lower net interest margins. The findings of this study are relevant for policymakers and poverty alleviation practitioners. There is a need to focus on improving market conditions to improve the efficiency of the banking sector and lower interest margins. The finding suggests that microfinance institutions may compromise on the microfinance promise and focus on safer clients to maintain financially sustainable and rely on conventional banks.

In the future, disentangling the involvement of microfinance institutes and conventional banks when it comes to financing needs further investigation. Unfortunately, there is limited data in the world bank mix database. Therefore, cross country studies on the impact of microfinance growth on commercial bank margins are limited. Future studies should focus on establishing the cause of the high net interest margins of MFIs and checking if they are pegged with commercial bank lending rates. Additionally, the impact of covid-19 on net interest margins is also an area that needs to be explored further.

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