Title: The analysis of bank profitability determinants in the banking sector of Azerbaijan

Abstract

The analysis of profitability determinants for banking sector in Azerbaijan was done in this study that used bank specific and external variables and analyzed these variables for the years between 2010 and 2020. A multiple linear regression model (with a panel data) was used as an inferential tool and the following results were obtained.

Firstly, bank size, capital adequacy and loan growth are significant and positive factors for bank profitability in Azerbaijan. On the contrary, credit risk, liquidity and leverage are negative for the financial performance (profitability) of banks in the country. Cost to income or cost efficiency ratio was not a significant factor for the profitability of banks. Furthermore, market share is not uniform in terms of its effect as it impacts ROA and ROE positively and significantly whereas its effect on net interest margin is not significant. Moreover, GDP growth rate was a significant and positive determinant of profitability whereas inflation was not significant despite its positive effect. Market share variable was a significant and positive for ROA and ROE whereas the same variable did not have a significant impact on net interest margin.

The recommendations for the banks suggest that they have a prudent risk management policy in order to exceed borrowing capacity, have a rigorous due diligence for loans in order to reduce the proportion of non-performing loans in the future, maintain a balance between loan and deposits so that unforeseen fund requirements can be covered, expand their loan portfolio to achieve a higher growth rate and seek the accomplishment of economies of scale through centralization and efficiency enhancement. Expansion of market share could also be helpful in terms of improving ROA and ROE of banks.

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Introduction

Background

Banks have played a crucial role in the facilitation of economic activities between economic agents in economy since their creation and this role has made them an invaluable part of the economy of every country (Duraj & Moci, 2015). Banks as a financial institution take deposits and give loans that encourage savings in the economy. Saving is essential for economic growth in the long-run which is boosted by the intermediary role of banks. Furthermore, banks also give loans which turn the deposits made in these institutions into investments in assets that generate returns (Menicucci & Paolucci, 2016). Banks are also important because of their provision of capital for the financing of operations of firms. Bank loans along with equity and debt issuance constitute the main proportion of funding options in the economy demonstrating the critical role of banks in the economy (Saif-Alyousfi, 2020). With regards to banks' importance, this varies from economy to economy as developed market economies have highly-developed structured capital markets in which financial institutions which are underwriters facilitate the bond issuance for companies and this somewhat reduces banks' role as a funding option for businesses. Capital markets are less developed in emerging market economies in which banks still are the main funding means for companies in contrast to developed economies in which hedge funds, venture capital firms and angel investors are much more numerous and fill some of the role that banks play exclusively in developing countries (Tan & Floros, 2012). However, banking sector has evolved as big financial institutions emerged that are active in all areas of banking such as commercial banking, investment banking and market-making. This fact has resulted in calls for increasing the regulation of banks as there is a growing level of conflict of interest in the banking sector due to their active participation in different sectors of the banking and investment management activities (Raffia, 2012). Thus, there is somewhat a different role of banks in economies meaning that their profitability determinants can be different as well.

Profitability is one of the utmost motives of organizations including financial institutions. In fact, conventional literature on the motives of the existence of a firm posited that the key motive of organizations should be the maximization of their shareholders' wealth (Slade, 2004). The activities of banking sector on a global scale prior to the financial crisis of 2008 reflected this motive as it was revealed that banks had been reckless in their profit-seeking motives which eventually led to the destabilization of the banking sector and the bailout of systematically important banks by governments across the world (Slade, 2004). Nevertheless, a myriad of change such as the increased role of the protection of the environment and a gradual shift of organizations to more sustainable existence

created a different scenario meaning that organizations can no longer rely on simply maximizing the wealth of their shareholders and there should be parallel but integrated aim of supporting sustainable operations (Constantinos & Voyazos, 2009). Financial institutions had a role to play in this important process as a facilitator in capital markets. In fact, this has been the case as financial institutions have been more active in the issuance of sustainable bonds and other instruments that aim to support climate activism. Thus, profitability as the main driver of the strategy of organizations has changed and a greater emphasis has been put on triple bottom line which is a strategy for organizations that highlight economic, social and environmental bottom line of organizations (Raffia, 2012). Hence, it is arguable that profitability as a concept has evolved to some extent from ultimate profit-seeking to more informed concept when organizations incorporate profitability into more comprehensive set of performance objectives.

Profitability, however, remains crucial for organizations as the financial performance and condition of the firm depends on how successful it is in terms of making profit which is further used for reinvestment and growth of the firm (Soffer & Revsine, 2014). Therefore, the determinants of profitability have been the subject of many studies with the aim of gaining understanding of bank profitability drivers so that relevant recommendations and policy actions can be developed for banks. Banking profitability literature has revealed that bank profitability variables can be intrinsic variables that are specific to the condition of a particular bank and external factors such as macroeconomic indicators of a country where they operate (Topak & Talu, 2017). Both groups of variables have been discovered to be significant in different studies. The significance of variables has not been uniform, however, indicating that the selection of the profitability variable also played a role whether a certain bank profitability determinant is significant or not (Supiyadi & Nugraha, 2018). Taking this into consideration, bank profitability studies have also assessed the profitability with regards to numerous ratios of profitability such as net interest margin, return on assets (ROA), return on equity (ROE) and net profit margin (Athanasaoglou, Delis, & Staikouras, 2008). Furthermore, selected potential drivers of profitability also changed from country to country and industry to industry in terms of their significance meaning that the context is important in bank profitability studies and generalizations are usually not accurate from one case to others.

Motivation for research

Azerbaijan is an upper middle income country which has undergone dramatic transformation since its break from the Soviet Union in the early 1990s. The country started the exploration of its oil and gas reserves independently with a wide range of Western partners in 1994 with the signing of the Contract of the Century (World Bank, 2022). Upon this important development, the country has been on the path of development and GDP growth skyrocketed to reach 34.5% in 2006 on the back of expanded oil and gas exploration and sale. However, this economic growth was deemed as mostly a catch-up effect by economists (World Bank, 2022). Besides, the proportion of oil rents in GDP was excessively high

illustrating the heavy dependence of the country's economy on oil and gas resources. This lack of diversification which is also called Dutch Syndrome came to the surface when oil prices declines significantly starting in 2013. The loss of export revenues put a pressure on foreign exchange reserves of the country and pushed the Central Bank of Azerbaijan to devalue the local currency Manat twice in 2015 (World Bank, 2022). The economic difficulties arising from this external shock reflected itself in the state of the banking sector as well. The banking sector in the country had accumulated loans denominated in foreign currencies prior to this unexpected devaluation. Following the devaluation of AZN, borrowers could not pay back their loans putting a strain on the operations of banks. In addition, banks themselves found it challenging to finance their own operations due to their foreign currency denominated obligations (The Guardian, 2015). These developments resulted in several banks being closed by the authorities and a consolidation in the banking sector took place. However, the loss of deposits of customers and businesses' inability to secure funding as easily as they did before resulted in a low confidence in the banking sector. Therefore, if the monetary authorities had acted in time to have prudent risk management policies to regulate the activities of the banking sector, the situation might have been different at least having a lower level of losses for depositors (Haentjnas, 2015). However, risk management policies are not the only solution for the stabilization of the banking sector of the country as it can be argued that the dependence on oil and gas resources for the revenues of the budget remains high despite the differentiation strategies that have been sought by the government since the devaluation of the currency in 2015 (World Bank, 2022). Hydrocarbon prices, therefore, are an external factor that affects the economy of Azerbaijan. The above-discussed points demonstrate that a banking sector study would be of high value for the current economic condition of the country as insights from this research would serve to develop relevant policies for banks. These policies would enable bank management to focus on the most important factors for the profitability of financial institutions and reduce the risk of a system-wide crisis that occurred in the last case of massive oil price decline.

Aims and objectives

The aim of the project is to discover significant variables for the profitability of banks in Azerbaijan

Objectives have been developed from this aim which have been presented next. The objectives have been developed based on the review of literature for the identification of important variables for the profitability of banks.

-To discover if size is a significant explanatory variable for bank profitability

-To discover if credit risk is a significant explanatory variable for bank profitability

-To discover if market share is a significant explanatory variable for bank profitability

-To discover if liquidity is a significant explanatory variable for bank profitability

-To discover if debt to assets (leverage) is a significant explanatory variable for bank profitability

-To discover if cost efficiency is a significant explanatory variable for bank profitability

-To discover if capital adequacy is a significant explanatory variable for bank profitability

-To discover if loan growth is a significant explanatory variable for bank profitability

-To discover if inflation rate is a significant explanatory variable for bank profitability

-To discover if GDP growth rate is a significant explanatory variable for bank profitability

Research structure

The study into the bank profitability determinants continues with Literature Review Chapter. This Chapter firstly lays the groundwork of the study through the discussion of theoretical framework that can be relevant in understanding profitability of banks. Additionally, empirical studies have also been presented and extensively discussed so that the most pertinent profitability determinants among bank-specific and macroeconomic variables can be determined. The most relevant of these variables to the case of the banking sector of Azerbaijan have then selected for the analysis in the project. Methodology Chapter explains how the research progresses in a step-by-step manner through the discussion of main methodological choices, strategies and analysis tools that have been applied for the completion of the project. Next, findings section presents the results of analytical tools applied and tests hypotheses. However, a detailed discussion of these findings is presented in the Discussion Chapter which follows Findings. Finally, Conclusion and Recommendation Chapter is the last one which firstly, summarizes what has been done in the research and what are the main findings. Recommendations are then presented which are practical suggestions for banks in Azerbaijan which they can use in order to improve their profitability as per the findings of this study.

Literature Review

The Structure-Conduct Performance Theory was one of the earliest approaches that aimed to investigate the profitability concept and how firms can earn a higher level of profit. This preposition argued that the structure of the industry defined the profitability level in this industry (Xu & Hu, 2019). SCP Theory has highlighted that technological factors that allow businesses to achieve economies of scale played a role in the competitiveness of the industry and eventually determined the profitability level in the industry. The role of monopoly power was also discussed in the SCP and according to its assumptions, a high level of profitability in the industry was a sign of monopoly power (Raffia, 2012). The relationship between industry structure and profitability was often found to be positive but not statistically significant in many cases. However, the theory was criticized because of the homogeneity of all the variables in the study (Raffia, 2012). Furthermore, standard industry classifications (SICs) were taken as variables that could potentially explain profitability of firms. However, the SCP was also criticized because SICs were not real industries and composed of a broad range of structures of industries and using these variables as potential determinant of profitability could not be viable (Davydenko, 2011). There have been attempts to develop models derived from SCP that addressed shortcomings of this theory which worked to a considerable accuracy in terms of explaining the variation in profitability, for example, in the cases of oligopoly in the market (Angela & Adina, 2013). However there was a need for a different stream of theories to explain profitability.

Firm market share as a determinant of profitability gained prominence as a theoretical approach explaining profitability. This view criticized SCP based on the fact that this approach argued for causality between industry structure and performance whereas the opposite was true meaning that firms with a higher level of profitability determined how concentrated the industry was (Slade, 2004). When there are large firms in the industry which are highly efficient, these firms expand their market share and earn a higher level of return (Slade, 2004). Studies that analyzed firm market share as a potential variable to explain profitability found differing findings meaning that depending on a context, market share of a firm might or might not be a significant determinant of profitability. Hence, there was a contested debate regarding whether SCP was a better approach to explain profitability compared to firm market share (Slade, 2004). Nevertheless, the findings of empirical studies at the time did not reveal a conclusive evidence for either preposition as context of studies played a role in the findings.

CAPM has been developed as a financial model that aims to link profitability of assets to the variable that account for this profitability. CAPM is a model that links profitability to systematic risk of assets. Systematic risk in this model is measured with beta of an asset which is a sensitivity of the asset to the market (Constantinos & Voyazos, 2009). A higher beta asset, therefore, is riskier and can command a higher return. This is a fundamental relationship between risk and return indicating that a higher risk results in a higher return.

CAPM model can be expressed in the following form.

Return=Risk free rate+Beta*Equity risk premium

As can be observed from the model, equity risk premium is the same in a market as it shows a historical excess return that the market has earned over risk-free rate. Moreover, risk-free rate is also the same in each market meaning that the return of an asset is explained with beta or systematic risk of the asset (Raffia, 2012).

With regards to testing the model empirically, studies examined CAPM in different settings and mostly rejected its prepositions in its simplest form. However, the model was robust when additional variables were added that could explain profitability (Raffia, 2012). Hence, it can be argued based on these findings that systematic risk is not the only factor that would explain profitability of a firm.

Bank specific and macroeconomic determinants of bank profitability have been studied in Turkey by Topak and Talu (2017) who examined data for the period of 2005-2015. ROA and ROE represented profitability and among the variables that have been analyzed as potential determinants of profitability, net fees and commission and net interest margin have been identified as significant and positive determinants of profitability of banks (Topak & Talu, 2017). In contrast, a negative effect of non-performing loans as percentage of total loans, operating expenses and capital adequacy were negative drivers of profitability meaning that these indicators resulted in a lower level of profitability in commercial banks in Turkey. One surprising element was that operating expenses had the most significant effect on profitability compared to other variables studied. Finally, among macroeconomic variables studied, GDP growth rate and interest rates had a positive and significant effect on profitability meaning that an expanding economy and higher rates can boost profitability. On the other hand, exchange rate was negatively associated with profitability being a sign of deterioration of profitability when the value of the local currency rises against USD.

Variables important for profitability of the banking sector of Ukraine have also been examined and bank-specific, macroeconomic and industry-specific variables have been picked for this purpose. The data of the researcher covered 2005-2009 and the findings of the research pointed to low quality of loans as a major factor that reduces the profitability of banks. Hence, non-performing loans were a major negative impact on profitability in Ukraine. Exchange rate was discovered to be a negative effect on performance as well and Ukrainian banks benefited from the depreciation of currency value against USD (Davydenko, 2011). Exclusively domestic-owned banks and foreign-owned banks were compared to observe the differences and the research determined that foreign-owned banks had higher profitability ratios indicating more efficient and effective running of these banks.

Bank specific variables and macroeconomic indicators can have different effect on banks also depending on a country and stage of development of these countries. One study compared transition countries and juxtaposed profitability of early transition and late stage transition countries. A data for 2000-2013 was used for the ex-USSR countries and the study came to the conclusion that credit risk worsens the profitability of commercial banks in countries which have reached more mature stages for transmission compared to early stage transmission countries where the impact of a higher credit risk had a more positive effect on profitability of banks. Better capitalization also had a higher level of impact on early transmission countries according to this research. Finally, government spending had a negative effect on profitability of banks in late transmission countries (Kurshid & Jennifer, 2016). This macroeconomic variable did not affect profitability in early stage transmission countries.

Key commercial banks in Nigeria which constitutes approximately, 60% of banking activities in the country were a sample of study by Osuagwu (2015) for the determination of bank profitability who similar to other studies used bank-specific, macroeconomic and industry variables for the evaluation of bank profitability. A credit risk was a significant and negative factor for bank profitability similar to many other studies and market concentration was also discovered to be significant for profitability in case of Nigeria. The study also showed that the effect of exchange rate on profitability also depends on which profitability measure is concerned. Return on equity and non-interest margin were significantly impacted by exchange rate as opposed to return on assets which is not affected significantly by this variable.

Kohlscheen et al., (2018) did a more general study of emerging market economy banks so that variables being common to these countries' banks can be determined. 534 banks were studied in this research that represented 19 countries. This research primarily focused on macroeconomic variable for the evaluation of profitability. Interest rates were significant and positive for short-term profitability. However, rates negatively affected profitability in the long-run. Business cycle was also taken into consideration and GDP growth was detected to be less significant for emerging market banks during normal times compared to loan growth meaning that loan growth contributes to the profitability of banks to a more significant extent. However, general creditworthiness of countries also had its say on profitability of banks because it was revealed that a rising sovereign risk premium reduced profitability of banks.

Emerging market context is also relevant for the economy of Bangladesh in which the profitability of largest 25 commercial banks was analyzed with a view to reveal what drives their profitability. A data for 2006-2013 was used in the research and ROA, ROE and net interest margin were profitability ratios for the research. Capital strength, credit risk, ownership structure, bank size, non-interest income, cost efficiency, off-balance sheet activities, and liquidity were tested as bank-specific variables in addition to

GDP growth rate and inflation as macroeconomic variables (Rahman & Hamid, 2015). Capital strength and loan growth were positive factors for profitability which were indicated in the findings of this analysis. Cost efficiency and off-balance sheet activities, in contrast, were a drag on profitability and were significant in this regard (Rahman & Hamid, 2015). Other variables did impact profitability but not in a uniform fashion meaning that drivers of profitability changed depending on which measure of profitability was used. For instance, size was a significant and positive variable for ROA whereas GDP growth improved net interest margin. Inflation was negative and significant both for ROA and ROE.

Sahyouni and Wang (2018) mixed developed and developing country data for the analysis of profitability determinants. 4995 banks from 11 countries were analyzed in this comprehensive study. The results indicated a lower level of profitability for banks that had a higher level of liquidity meaning that liquidity creation had a negative impact on profitability. Bank size and capital ratio were significant in their effect on profitability in the sample banks. Larger banks with a higher capital adequacy ratio had a higher profitability in accordance with the findings. Credit quality, on the contrary, along with efficiency drove down profit levels as banks that extend high quality loans mostly missed out on risk and profitability (Sahyouni & Wang, 2018). Macroeconomic variables in this research did not have a uniform effect on profitability and varied from country to country.

Turkish banks' profitability covering bank specific, macroeconomic and industry-related variables was examined by Akbas and 26 banks were included in the research. A period covering between 2005 and 2010 was used for data collection and ROA and ROE were variables standing for profitability. This study also concluded that variables of profitability played a role when it comes to which independent variables were significant. When ROA was taken as a proxy of profitability, credit risk, total costs, market concentration and level of deposits were significant variables for explaining profitability. When ROE was a proxy of profitability, however, capital structure, credit risk, total costs, total asset and concentration level of the market drove profitability (Akbas, 2012). Therefore, it is concluded that depending on which profitability measure is used, significant variables might be different.

Amoah (2015) investigated bank profitability variables for banks in Ghana. Both foreign-owned and locally-owned banks were researched in this study and a data was taken from 1999 to 2010. The findings illustrated that cost management is negatively related to bank profitability whereas credit risk and bank size were positively related to profitability.

Herdayinta (2019) analyzed the case of Regional Development Bank in Indonesia as one of the important financial institutions in the country and studied profitability variables for the period of 2011-2016. Total assets, loan to deposit ratio, operating expenses and net interest margin were significant variables in terms of accounting for the change in ROA and ROE. All variables except for operating expenses had a positive impact on profitability in contrast to operating expenses to operating income ratio that

revealed a negative relationship between this ratio and profitability. Inflation, similarly, had a negative effect on profitability both for the case of ROA and ROE.

Bank profitability in sub-Saharan African countries was investigated covered the cases of 389 commercial banks. Bank size, diversification level, credit risk and private ownership had a positive effect on bank profitability indicating that a larger bank size, a greater level of diversification, a level of credit risk and private ownership improved bank profitability (Flamina, McDonald, & Schumacher, 2009). Additionally, inflation rate and economic growth boosted profitability of sub-Saharan African banks.

2,446 banks were studied in Asian countries so that profitability determinants of banks in 47 Asian countries can be determined. The data ranged from 1995 to 2017 and found that higher opportunity costs, higher capitalization of banks, a greater level of deposits and assumption of a greater level of market risk improved profitability of banks in Asian countries. What is more, a larger level of loans and loan growth rate drove up profitability of the banks in the sample. Moreover, credit risk which was measured with non-performing loans as percentage of total loans had a negative effect on profitability. Higher economic growth rates, higher inflation rate and higher interest rates also improved profitability of banks in the sample (Saif-Alyousfi, 2020). The study further investigated the effect of financial crisis on the condition of banking sector in the countries. It was determined that a negative effect of the crisis on bank profitability has been obtained.

Asian banks were also examined in three specific countries which are Pakistan, Bangladesh and Sri-Lanka and the study investigated determinants of profitability of banks in these countries. Data ranging from 1997 to 2008 was covered in the research. The effect of liquidity, non-interest income, credit risk and capitalization had a positive and significant impact on profitability of banks in these countries. Regarding macroeconomic indicators, economic growth rate and inflation were studied and it was identified that GDP growth rate had a positive and significant effect on profitability whereas inflation did not have a significant effect on profitability (Sufian, Determinants of bank profitability in developing economies: empirical evidence from the South Asian banking sectors, 2012).

Commercial banks of 27 European countries were analyzed for discovering profitability indicators of them. The data for the research was taken covering 2004-2011. Intrinsic factors which are bank-specific were analyzed in addition to macroeconomic and industry variables which were extrinsic variables. Return on average assets and return on average equity were included as variables of profitability. It was discovered that credit risk, liquidity risk, management efficiency, diversification of the industry, market competition, and economic growth had a significant effect on profitability of banks in the EU (Petria & Capraru, 2015).

Ally (2014) looked into Tanzanian banks for the purpose of revealing bank profitability factors. Again, bank specific and macroeconomic variables were examined similar to other studies. Dara from 2009 to 2013 was analyzed which had been taken from 23 commercial banks. Size, capital adequacy, asset quality, expense management and liquidity risk had a significant effect on bank profitability in Tanzania. However, macroeconomic variables that were analyzed in the research were not significant for the banks in the country (Ally, 2014).

Data from 1990-2005 was investigated in the context of Philippines so that profitability determinants of banks in the country can be identified. Expense preference behavior, size and credit risk are negative factors for profitability of banks in the country. Non-interest income and capitalization were positive influences on the profitability of the examined banks. In addition to bank variables, macroeconomic variables have also been studied in this research and inflation was found as a negative effect on profitability of banks in Philippines (Sufian & Chong, DETERMINANTS OF BANK PROFITABILITY IN A DEVELOPING ECONOMY: EMPIRICAL EVIDENCE FROM THE PHILIPPINES , 2008). Moreover, money supply, GDP growth rate and capitalization level of stock market did not explain a considerable part of profitability of banks in the country.

European banking sector profitability has also been analyzed by Menicucci and Paolucci (2016) who collected and analyzed data for 35 big commercial banks in Europe for the period of 2009-2013. Internal factors of profitability were analyzed in this project and the findings showed that the impact of different variables on profitability indicators is not uniform. Size and capital ratio were significant variables for the profitability of banks in Europe. Loan loss provisions were however, reduced the profitability of banks in the continent indicating a negative effect of credit risk on bank profitability. Deposit and loan levels were also significant variables for explaining profitability of banks among the 35 commercial banks analyzed (Menicucci & Paolucci, 2016).

Profitability analysis of top 10 commercial banks in Pakistan was carried out. The study used data for 2004-2008 and ROA was used as a proxy of profitability in this research. Assets, loans, equity level and deposits have been studied as variables of potential significance for profitability of banks. Diseconomies of scale were found out because a higher level of total assets did not lead to a higher profitability. The effect of loan level on profitability was not significant either meaning that having a higher loan level did not bring an associated increase in profitability level. Nevertheless, the effect of equity and deposits was significant and positive indicating that increasing the proportion of equity level in the capital structure of banks and accumulating more deposits would help to improve profitability of banks in Pakistan (Javadi, Anwar, Zaman, & Ghafoor, 2011).

Empirical evidence from the Sharia banking sector in Indonesia was also provided by Supiyadi and Nugraha (2018) so that profitability determinants can be identified. The research used data from 2010-

2017 and used ROA as a profitability measure. Capital adequacy, credit risk and size had a significant but a negative impact on profitability of banks in the case of Indonesian banks. Liquidity had a positive and significant effect on profitability. The findings with respect to external factors, however, the impact of these variables was somewhat conflicting with previous studies. Although the impact of inflation varied in other studies as well, the finding that inflation was a positive factor for profitability was not surprising. However, GDP growth rate had a negative and significant impact on profitability of Sharia banks in Indonesia which was contrary to previous studies. Hence, profitability of these banks tend to be higher during economic contraction as opposed to expansion (Supiyadi & Nugraha, 2018).

Islam and Nishiyama (2016) looked into profitability of 259 commercial banks in South Asia. Bangladesh, India, Nepal and Pakistan banks were in the sample and the data encompassed 1997-2012. Cost of funds, liquidity, funding gap, and term structure of interest rates reduced bank profitability in these countries. This meant that high borrowing costs dragged down bank profitability which is in line with other studies. Additionally, liquidity also negatively affected bank profitability because a higher level of liquidity tied up funds in less risky investments and reduced bank profitability. Surprisingly, GDP growth rate also negatively influenced bank profitability in the countries. Inflation, on the other hand, was a positive factor for bank profitability (Islam & Nishiyama, 2016).

Macao banking sector has been studied in order to determine bank profitability indicators. It was identified that bank profitability is positively and significantly affected by capital strength of banks. Thus, banks with a higher level of capital in the country performed better compared to those with lower capital adequacy. This was interpreted as a result of a lower risk associated with a higher capital level of banks. Loan loss provision level was a negative factor for the performance of banks indicating that if banks have earmarked a higher level of loan losses, this led to a lower level of profit for the relevant banks. This indicates that asset quality is an important characteristic for bank profitability and having non-performing loans in the books of the firm that is of substantial level leads to the deterioration of profitability (Vong & Chan, 2010). This study also examined if the size of a retail deposit network impacted profitability and the results indicated that banks with a larger network for retail deposits did not make a significance difference. In other words, size of the network of banks could not be a determinant of bank profitability in this sense. The study also analyzed macroeconomic variables as determinants of bank profitability and revealed that only inflation rate had a positive and significant effect on profitability of banks in Macao.

Ramadan et al., (2011) did a similar study for the banks in Jordan. Jordanian banks were examined with a view to determine which variables are significant for their profitability. 10 banks which are the largest in terms of asset size in the country were researched in this paper and data for them was taken for the period of 2001-2010. ROE and ROA were accepted as measures of profitability in this research and the

study came to the conclusion that the majority of the change in profitability in Jordanian banks could be explained with bank characteristics. Well-capitalized banks tended to be more profitable which was reflected in the findings of this research. A high level of lending activities also drove profitability up illustrating that if banks had a larger loan portfolio, they could improve their profitability to a significant extent. A lower level of credit risk also had a positive effect on profitability showing that banks in Jordan. Finally, the efficiency of cost management also improved profitability of banks in the country. With respect to the effect of size of banks on profitability, it was discovered that economies of scale were not significant in terms of accounting for the variability in the profitability of banks (Ramadan, Kilani, & Kaddumi, 2011).

Bank specific and macroeconomic indicators were tested as potential variables that could explain bank profitability in the case of Greek banks. The case of 6 biggest Greek banks was examined in this research. The results showed that bank size is a positive and significant variable for Greek banks meaning that Greek banks have established economies of scale which improve their profitability. Furthermore, credit risk is a negative and statistically significant variable for determining the profitability of banking sector which is similar to the findings of previous studies as a higher level of credit risk often was a negative factor for profitability in the banking sector profitability studies. Results with respect to bank productivity deviated from the findings of studies that are considered a mainstream in this area. This study discovered that productivity of banks was negatively associated with profitability meaning that banks with a higher level of assets over personnel had a lower level of profitability. Cost to income ratio which is the determinant of the efficiency of banking sector also had a negative effect on profitability in the case of Greek banks. Bank liquidity which is assessed with the ratio of bank loans to deposits had a negative effect on bank profitability as well and this impact was significant (Constantinos & Voyazos, 2009).

Banking sector profitability variables have been studied in the case of South Eastern European countries. Albania, Bosnia-Herzegovina, Bulgaria, Croatia, FYROM, Romania and Serbia-Montenegro were in the sample and main commercial banks of these countries were analyzed for the period for 1998-2002. Both internal and external factors were included in the research for the analysis of the profitability of banks (Athanasaoglou, Delis, & Staikouras, 2008). ROA and ROE were main profitability variables in this research and the findings suggested that credit risk variable had a negative effect on profitability showing the necessity of having prudent risk management policies in place. Moreover, liquidity risk had a positive impact on profitability which was against the expected sign of the variable in line with previous studies. Capital adequacy had a positive effect on profitability and this result was particularly significant when ROA is taken as a measure of profitability in the banking sector. This finding indicated the importance of building an adequate capital level so that bank risks can be cushioned against this capital buffer. Additionally, operating expenses to operating income or efficiency variable had a negative

and significant effect on profitability banks which is also expected of the sign of this variable based on the review of previous studies. Foreign ownership has also been considered as other studies showed that the performance of foreign-owned and locally-owned banks can diverge significantly. The research found that foreign-owned banks performed significantly better compared to banks with local ownership. The impact of concentration on profitability was significant only when the profitability is measured with ROA and ROE indicated an insignificant effect of concentration in the industry on profitability. Inflation was also analyzed and this macroeconomic variable had a positive and significant outcome for bank profitability. Thus, both macroeconomic and internal variables were significant with respect to explaining the profitability of commercial banks in South Eastern Europe.

A particular focus of study by Tan and Florus (2012) was an inflation and how it affects banking profitability in China. While studying the effect of inflation rate on profitability, the research also controlled for other potential determinants of the profitability of the country's banking sector. A total sample size in the study was 101 commercial banks and the data for the research covered 2003-2009. An empirical analysis determined that a low profitability in the banking sector of the country was attributable to a high level of non-traditional activities in the banking sector and a high level of taxes imposed on banks. Additionally, this research also identified a strong impact of banking sector development on the profitability of the sector in the country. Finally, the research indeed discovered a significant effect of inflation on profitability (Tan & Floros, 2012).

A low profitability situation in the banking sector of Angola was a focus of a study which aimed to determine the main drivers of profitability so that relevant recommendations can be given to improve profitability in the banking sector. 17 large banks were examined during 2010 and 2016 in this paper. Return on average assets and return on average equity were taken as profitability measures and a wide range of bank variables and macroeconomic variables have been included to control for the variation in profitability (Garcia & Trindade, 2019). The research found that ownership of banks was a determinant for their profitability with respect to the origin of ownership (local or foreign ownership). Additionally, credit risk and liquidity risk had a negative impact on profitability whereas the level of deposits improved profitability significantly.

Central European countries' profitability has been studied by Uralov (2020) who looked into the data between 1996-2017. Return on investment, return on equity and net interest margin were measures of profitability and a combination of a comprehensive list of internal and external variables was applied to learn which of them are significant for bank profitability. There has been a lack of uniformity regarding the effect of variables on profitability. For example, GDP growth rate only improved ROA significantly whereas other variables did not change to a considerable extent under the influence of GDP growth. Inflation rate, contrary to GDP growth rate, improved all three variables of profitability and this effect

was significant statistically. Furthermore, Uralov (2012) also showed that non-performing loans as a measure of credit risk reduced the profitability of banks significantly. Moreover, operating expenses were also significant and negative in terms of changing profitability meaning that a higher operating cost for businesses worsened their profitability.

Another emerging European country in which banking profitability and its determinants have been evaluated is Romania. An approach integrating both bank-specific and external variables has been used by researchers and the findings indicated that asset quality, management quality and liquidity of banks impacted their profitability significantly. Lower asset quality which is reflected in a higher level of non-performing loans was undesirable for banks due to its negative effect. Additionally, a higher level of liquidity seemed to indicate a higher profitability of respective banks. Banking concentration as a sign of competitiveness also improved bank profitability in addition to GDP growth rate which had a similar impact on banks (Angela & Adina, 2013).

The determinants of profitability were also studied in Ethiopia and similar to other studies, both bank-related variables and macroeconomic (external) variables were analyzed in this research. ROE and net interest margin were used as proxies of bank profitability. The results of the research showed that such bank-specific variables as capital adequacy, management efficiency, earnings and liquidity ratios significantly impacted bank profitability when ROA is accepted as profitability measure. On the contrary, net interest margin was significantly impacted by only capital adequacy and earnings ratios. Moreover, industry growth rate which was industry-related variables also had a significant and positive impact on profitability of banks in Ethiopia. The study also identified that macroeconomic variables were positive but insignificant with regards to their effect on bank profitability. The research covered time period between 2005 and 2015.

Duraj and Moci (2015) contributed to the bank profitability determinants literature through their analysis of bank profitability in Albania. This research picked such internal variables as deposit to loans ratio, non-performing loans ratio, GDP growth rate, inflation and loan level. The research findings showed that variables account for a significant variation in bank profitability. Moreover, deposit to loans ratio is positive and statistically significant pointing out the importance of a greater level of deposits in the balance of banks so that their risks are at a manageable level. An excessive level of loans would reduce quality and worsen profitability of financial institutions. Non-performing loans ratio, on the contrary, had a negative effect on profitability indicating a negative relationship between credit risk and profitability of banks in Albania. Loan levels had a negative relationship with profitability being the sign of the fact that banks with a higher level of loans tend to have a lower level of profitability as well again shedding light on the importance of having a sufficient deposit level for banks. Additionally, both GDP growth rate and inflation rate also had a significant effect on banks' profitability. However, the sign of

the impact of these two variables varied as GDP growth rate was a positive influence on GDP whereas inflation was negative (Duraj & Moci, 2015).

Sufian and Habibullah (2009) investigated the banks in China and contributed to the body of knowledge in the area of bank profitability. The research covered 2000-2005 which is a pre-crisis period and determined the significance of all variables in the paper. Nonetheless, not all variables had the same impact on different types of banks and banks' organizational types impacted how their profitability was affected by potential bank profitability variables. With regards to state owned banks in China, the research found that liquidity, credit risk and capitalization had a positive and significant impact on profitability whereas the effect of cost was negative for state owned banks. Moreover, the case of Joint Stock Commercial Banks in the country indicated that credit risk is a significant and positive impact for the profitability in contrast to costs to income ratio which was a negative factor for profitability (Sufian & Habibullah, Bank specific and macroeconomic determinants of bank profitability: Empirical evidence from the China banking sector, 2009). Finally, City Commercial Banks were studied in China and the findings showed that better capitalization level of these banks improved their profitability. Additionally, it was shown that the effect of GDP growth rate and money supply growth negatively impacted bank profitability for City Commercial Banks and Joint Stock Commercial Banks.

Methodology

Approach to research process

Research process can move from general to specific or vice versa illustrating that either deductive or inductive reasoning can be applied in studies. Deductive reasoning or approach is essentially hypothesis testing meaning that a hypothesis is derived from theories and tested with data collected by the researcher (Tan W. , 2017). Inductive reasoning or method is the opposite of deductive reasoning and in this type of approach, the researcher evaluates a phenomenon with data and then moves on to develop a theory from the findings in this specific case.

The analysis of bank profitability determinants reflects the principles of deductive reasoning as this research chooses variables from theory and testes them as potential determinants of profitability and no theory creation takes place. In conclusion, as this research is about testing existing theories, it is deductive study.

Research methods

The selection of the right research method depends on the type of data needed for the research. Quantitative and qualitative research methods or a mixture of these two methods have been encountered in business studies (Crowther & Lancaster, 2012). Regarding the type of data, if numeric data is needed for the study, then quantitative methods are more appropriate because these methods have been designed for collection and analysis of numeric data. Quantitative analysis tools can be selected from statistics in order to analyze numeric data and carry out quantitative method research. Qualitative research is reserved for non-numeric variables and their analysis through qualitative methods of analysis (Crowther & Lancaster, 2012). If qualitative data is more appropriate due to the subjectivity of the research question, then qualitative methods of research are applied and the findings of research studies applying these methods cannot be generalized to other instances.

Finding the variables that are important for profitability of banks is the subject of this research and based on the previous studies and precedents in this area, variables that measure bank profitability are expressed in numeric terms. Both internal (bank-specific) and external (macroeconomic) variables are analyzed with numeric variables and this study has adhered to this method of data collection and analysis. In sum, quantitative methods are used in this research so that data for potential determinants of profitability can be obtained and analyzed.

Time horizon of research

Time horizon of research is identified with respect to whether the research covers more than period in its analysis or only concentrates on one period. The former is considered as time series research because it studies phenomena using its value in different time periods and the trend of the variables

affect the relationship between them as there might be variations in the relationship of variables through time (Taylor, 2005). However, the second method which is called cross-sectional framework only assesses the relationships at a specific point usually for the most recent time period available to the researcher for data collection.

The study of bank profitability determinants in a particular country has been carried out as a panel study in previous studies. Panel data is a multidimensional data that encompasses both cross-sectional and longitudinal data meaning that a number of observations on cross-sectional units. This study covers 2010-2020 as a time period of the research and analyzes variables for 12 commercial banks in the country. This means that a panel data has been applied in this research.

Model of the study

The model of the research is built on a concept that profitability of banks is affected by a broad range of factors and these factors have been selected from the existing literature. These factors are called profitability determinants and discussed next. Profitability determinants are explanatory or independent variables in this research whereas profitability variables themselves are dependent variables which are discussed after the discussion of the determinants.

Size of banks:

Size variable is investigated in studies of bank profitability as economies of scale can be an important variable that would enable banks to reduce their costs while spreading costs over a larger number of units (Angela & Adina, 2013). In fact, bank size was included in bank profitability studies in previous studies and often found to be significant in terms of improving bank profitability. Therefore, size of banks is a variable in this research which might also potentially explain variation in bank profitability in Azerbaijan.

Credit risk:

Credit risk which is measured with a proxy of non-performing loans as percentage of total loans is examined as a potential profitability variable in previous research papers. Credit risk is not uniform in terms of its effect on profitability as its impact was positive, negative or neutral (Constantinos & Voyazos, 2009). Credit risk, therefore, can be a positive factor for profitability as a higher level of risk allowed banks to improve their profitability. Nevertheless, rising level of risk was also negative beyond a certain point indicating that the sign of credit risk might differ depending on a study context. Hence, this variable is also relevant for the case of Azerbaijani commercial banks and analyzed in this paper.

Liquidity of banks:

Liquidity is one of the areas which are highly important for the activities of banks and it is evaluated in this research as well in order to determine the impact of bank liquidity on profitability. Although there are several indicators measuring the liquidity of banks, loan to deposits ratio is used in this research which is similar to numerous previous studies which have investigated bank profitability (Kohlscheen, Pabon, & Contraras, 2018).

Loan to deposit ratio shows the proportion of loans in deposits of banks and a higher level of this ratio would demonstrate that a bank does not have sufficient liquidity as too much of its funds tied up in loans (Davydenko, 2011). Moreover, too low value of this variable is also a negative indicator for banks owing to the fact that banks would have too high liquidity which would prevent them from earning higher amount from loans (Duraj & Moci, 2015). Thus, considering the informative nature of this ratio in terms of assessing the liquidity of banks, it has been integrated as the indicator of bank profitability in this research.

Efficiency of banks:

Cost efficiency of banks has also been studied exhaustively in previous studies and its effect is often negative. Efficiency is measured with the division of operating costs to operating income of banks and a higher level of this ratio would mean that banks have a higher level of costs compared to their income and costs are not managed as efficiently as they could (Akbas, 2012). In this regard, the evaluation of the impact of this variable on profitability of banks would be informative in the case of Azerbaijan with respect to the evaluation of the cost efficiency of banks. Thus, efficiency of banks is measured with cost to income ratio in this variable and used as a potential determinant of bank profitability in this study.

Market share of banks:

Market share of banks has been taken as another variable for this research. Market share was theoretically proposed as a potential explanatory variable of profitability (Kohlscheen, Pabon, & Contraras, 2018). This was based on the idea that expanding market share of firms give them an opportunity to expand their operations and profitability. Hence, this variable was also integrated into this research's model as an explanatory variable (Kurshid & Jennifer, 2016). There are banks of different sizes in Azerbaijan as well and it might be the fact that the market share of these banks might explain their profitability significantly justifying the selection of this variable.

Capital:

Capital takes a central role in the studies of bank profitability because capital level of banks provides them with needed safety in terms of absorbing losses. The proxy for capital in this study similar to previous papers has been the capital adequacy ratio which is a ratio of total available capital of banks to

their risk weighted assets (Saif-Alyousfi, 2020). This ratio is also published by banks in their annual reports. The effect of this variable is either negative or positive that might change depending on a research as there is no uniformity in findings.

Leverage of banks:

Leverage is used by financial institutions to expand their operations as a cheaper source of funding. Debt financing has tax protection feature for interest expenses which attract investors to this form of funding. Moreover, this financing option has less information content and has been suggested as the second most preferable funding option after internal funding based on retained earnings (Slade, 2004). Nevertheless, debt financing is not without consequences as a higher leverage increases cost of equity and bankruptcy costs. Additionally, high leverage also reduces the attractiveness of firms as a creditworthy counterpart (Sufian, Determinants of bank profitability in developing economies: empirical evidence from the South Asian banking sectors, 2012). Due to these facts, the effect of leverage on bank profitability was not uniform. Previous studies found negative, positive and no impact of this indicator on profitability meaning that a proportion of this variable in capital structure of banks defines whether the effect is positive or negative.

Taking these comments into consideration, leverage is a relevant variable and has been examined in the case of Azerbaijani banks. Leverage can be measured in different ways and debt to total assets of the banks has been selected as a variable of leverage which shows which proportion of total assets of the banks comes from debt financing as opposed to equity.

Loan growth:

This variable is measured with a percentage change of the loan levels from year to year.

Economic growth:

Economic growth is a driving force for the development of an economy and expanding economy provides economic agents with an opportunity to grow as well. Economic growth, therefore, can be an external factor that either supports or hinders the profitability of local businesses (Constantinos & Voyazos, 2009). If the general economic conditions in the economy are not favorable, it is not logical to expect businesses to do well too. In this regard, economic growth which is measured with GDP growth rate has been studied by previous researchers as a profitability determinant. Not surprisingly, this variable has been a significant determinant of growth in many instances corroborating the idea of the importance of economic growth (Herdhayinta, 2019). GDP growth rate is measured with the change in the level of real GDP in the country and this method of assessing economic growth has been accepted in this study as well.

Inflation:

Inflation rate is a change in the level of consumer prices. Although some level of inflation which is considered a natural level of inflation is expected and healthy for the economy of a country, usually an increasing level of inflation hurts economic agents and population in general as price increase reduces the purchasing power of the currency (Ally, 2014). Therefore, inflation has often been found to be as a negative determinant of profitability as higher levels of inflation coincided with a lower level of profitability. The post Covid-19 period has been associated with a high level of inflation due to mostly supply chain disruptions that took place under the strain of the lockdowns enforced across the world. Hence, inflation is a concept that is a current issue on the agenda of Central Banks all over the world and the analysis of this variable as a determinant of profitability in the case of Azerbaijan is also both suitable due to the global situation with regards to inflation as well as empirical literature on the importance of inflation as a significant variable for profitability.

ROA:

Return on Assets is a ratio of profitability that is calculated by net profit over total assets. The ratio illustrates how profitable the use of the assets of an organization (Soffer & Revsine, 2014). Many previous studies used ROA as a measure of profitability and this research has applied a similar approach and included ROA as a profitability indicator.

ROE:

Return on Equity is a ratio of profitability that is calculated by net profit over total shareholders' equity. It demonstrates how profitable it is to invest in the assets of a firm (Soffer & Revsine, 2014). Similar to previous studies this research has selected ROE as a profitability measure.

Net interest margin:

Net interest margin is a profitability ratio for financial institutions that is calculated by dividing the difference between interest earned and interest paid to the average total assets. Banks earn interest from their loans that have given to borrowers (Soffer & Revsine, 2014). At the same time, banks also pay interest to depositors which is a cost for banks. The difference between the two variables is net interest earned and it is expressed as percentage of total assets. A higher level of net interest margin is a sign of a better financial performance and demonstrating that interest earned on loans was much higher compared to interest expenses paid on deposits.

Based on the discussion above, the full model for each 3 profitability indicator (ROA, ROE and net interest margin) is as follows.

Profitability ($ROAi,t$)= β0 + β1Size i,t + β2Capital adequacy i,t + β3Debt to Assets i,t + β4 Credit risk i,t+β5Market share i,t+β6Liquidity i,t + β7Cost Efficiency i,t + β8Loan growth i,t +β9Inflation rate i,t + β10GDP growth rate i,t

Profitability ($ROEi,t$)= β0 + β1Size i,t + β2Capital adequacy i,t + β3Debt to Assets i,t + β4 Credit risk i,t+β5Market share i,t+β6Liquidity i,t + β7Cost Efficiency i,t + β8Loan growth i,t +β9Inflation rate i,t + β10GDP growth rate i,t

Profitability ($\text{Net interest margin}\ i,t$)= β0 + β1Size i,t + β2Capital adequacy i,t + β3Debt to Assets i,t + β4 Credit risk i,t+β5Market share i,t+β6Liquidity i,t + β7Cost Efficiency i,t + β8Loan growth i,t +β9Inflation rate i,t + β10GDP growth rate i,t

Hypotheses involving ROA

Hypothesis 1

Null: The effect of size of banks is not significant with regards to explaining the variation in ROA

Alternative: The effect of size of banks is significant with regards to explaining the variation in ROA

Hypothesis 2

Null: The effect of credit risk of banks is not significant with regards to explaining the variation in ROA

Alternative: The effect of credit risk of banks is significant with regards to explaining the variation in ROA

Hypothesis 3

Null: The effect of liquidity of banks is not significant with regards to explaining the variation in ROA

Alternative: The effect of liquidity of banks is significant with regards to explaining the variation in ROA

Hypothesis 4

Null: The effect of cost efficiency of banks is not significant with regards to explaining the variation in ROA

Alternative: The effect of cost efficiency of banks is significant with regards to explaining the variation in ROA

Hypothesis 5

Null: The effect of capital of banks is not significant with regards to explaining the variation in ROA

Alternative: The effect of capital of banks is significant with regards to explaining the variation in ROA

Hypothesis 6

Null: The effect of market share of banks is not significant with regards to explaining the variation in ROA

Alternative: The effect of market share of banks is significant with regards to explaining the variation in ROA

Hypothesis 7

Null: Debt to assets (leverage) of banks is not significant with regards to explaining the variation in ROA

Alternative: Debt to assets (leverage) of banks is significant with regards to explaining the variation in ROA

Hypothesis 8

Null: Loan growth of banks is not significant with regards to explaining the variation in ROA

Alternative: Loan growth of banks is significant with regards to explaining the variation in ROA

Hypothesis 9

Null: The effect of GDP growth rate (economic growth) is not significant with regards to explaining the variation in ROA

Alternative: The effect of GDP growth rate (economic growth) is significant with regards to explaining the variation in ROA

Hypothesis 10

Null: Inflation rate of the country is not significant with regards to explaining the variation in ROA

Alternative: Inflation rate of the country is significant with regards to explaining the variation in ROA

Hypotheses involving ROE

Hypothesis 1

Null: The effect of size of banks is not significant with regards to explaining the variation in ROE

Alternative: The effect of size of banks is significant with regards to explaining the variation in ROE

Hypothesis 2

Null: The effect of credit risk of banks is not significant with regards to explaining the variation in ROE

Alternative: The effect of credit risk of banks is significant with regards to explaining the variation in ROE

Hypothesis 3

Null: The effect of liquidity of banks is not significant with regards to explaining the variation in ROE

Alternative: The effect of liquidity of banks is significant with regards to explaining the variation in ROE

Hypothesis 4

Null: The effect of cost efficiency of banks is not significant with regards to explaining the variation in ROE

Alternative: The effect of cost efficiency of banks is significant with regards to explaining the variation in ROE

Hypothesis 5

Null: The effect of capital of banks is not significant with regards to explaining the variation in ROE

Alternative: The effect of capital of banks is significant with regards to explaining the variation in ROE

Hypothesis 6

Null: The effect of market share of banks is not significant with regards to explaining the variation in ROE

Alternative: The effect of market share of banks is significant with regards to explaining the variation in ROE

Hypothesis 7

Null: Debt to assets (leverage) of banks is not significant with regards to explaining the variation in ROE

Alternative: Debt to assets (leverage) of banks is significant with regards to explaining the variation in ROE

Hypothesis 8

Null: Loan growth of banks is not significant with regards to explaining the variation in ROE

Alternative: Loan growth of banks is significant with regards to explaining the variation in ROE

Hypothesis 9

Null: The effect of GDP growth rate (economic growth) is not significant with regards to explaining the variation in ROE

Alternative: The effect of GDP growth rate (economic growth) is significant with regards to explaining the variation in ROE

Hypothesis 10

Null: Inflation rate of the country is not significant with regards to explaining the variation in ROE

Alternative: Inflation rate of the country is significant with regards to explaining the variation in ROE

Hypotheses involving net interest margin

Hypothesis 1

Null: The effect of size of banks is not significant with regards to explaining the variation in net interest margin

Alternative: The effect of size of banks is significant with regards to explaining the variation in net interest margin

Hypothesis 2

Null: The effect of credit risk of banks is not significant with regards to explaining the variation in net interest margin

Alternative: The effect of credit risk of banks is significant with regards to explaining the variation in net interest margin

Hypothesis 3

Null: The effect of liquidity of banks is not significant with regards to explaining the variation in net interest margin

Alternative: The effect of liquidity of banks is significant with regards to explaining the variation in net interest margin

Hypothesis 4

Null: The effect of cost efficiency of banks is not significant with regards to explaining the variation in net interest margin

Alternative: The effect of cost efficiency of banks is significant with regards to explaining the variation in net interest margin

Hypothesis 5

Null: The effect of capital of banks is not significant with regards to explaining the variation in net interest margin

Alternative: The effect of capital of banks is significant with regards to explaining the variation in net interest margin

Hypothesis 6

Null: The effect of market share of banks is not significant with regards to explaining the variation in net profit margin

Alternative: The effect of market share of banks is significant with regards to explaining the variation in net profit margin

Hypothesis 7

Null: Debt to assets (leverage) of banks is not significant with regards to explaining the variation in net interest margin

Alternative: Debt to assets (leverage) of banks is significant with regards to explaining the variation in net interest margin

Hypothesis 8

Null: Loan growth of banks is not significant with regards to explaining the variation in net interest margin

Alternative: Loan growth of banks is significant with regards to explaining the variation in net interest margin

Hypothesis 9

Null: The effect of GDP growth rate (economic growth) is not significant with regards to explaining the variation in net interest margin

Alternative: The effect of GDP growth rate (economic growth) is significant with regards to explaining the variation in net interest margin

Hypothesis 10

Null: Inflation rate of the country is not significant with regards to explaining the variation in net interest margin

Alternative: Inflation rate of the country is significant with regards to explaining the variation in net interest margin

Data collection

Variables that have been identified in the previous sections require the collection of numeric data. Primary and secondary methods of data collection should be selected from for data collection. Primary data is a data that is collected by the researcher in real time and it is collected for the first time (Cooper, Schindler, & Sharma, 2018). Primary data is often applicable only to a specific research and cannot be used for further studies. Secondary data as the name suggests is the past data that has been collected prior to the research and it is applicable to many studies that come after the data collection. This type of data is often either company fundamental data such as financial reports or economy-wide data such as GDP, inflation, unemployment and similar statistics (Crowther & Lancaster, 2012).

Studies for discovering significant profitability indicators have been carried out with secondary data in existing literature and this study has used a similar approach. As bank profitability determinants are published either in annual reports of banks or macroeconomic publications of governments and international organizations, secondary data has been sufficient for this research.

A subset of the population is often selected from the available population in research because it is impractical and often impossible to analyze all population items in a single study (Cooper, Schindler, & Sharma, 2018). This process of selecting the items to be used in the current research is called sampling. Probability and non-probability sampling are identified as two methods of sampling. Sampling through a probability based sampling process involves a random selection using probability rules. In contrast, non-probability sampling does not apply random selection through equal probability for each item in population (Cooper, Schindler, & Sharma, 2018). Instead, items of the population are selected which can realistically be evaluated by the researcher.

A study that analyzes profitability determinants in the banking sector of Azerbaijan has been done using non-probability sampling method since it was not possible to have an access to data for all banks in the country. The research requires a comprehensive data on banks as a wide range of variables have been selected for evaluation. Furthermore, time horizon requirement should also be fulfilled meaning that

the data for the banks in the sample should cover the years between 2010 and 2020. When assessing the availability of data for this purpose, it was identified that only 12 banks had this level of data and have been included in the sample of this research, therefore. However, these banks are important for the banking sector of the country due to their coverage of the large proportion of the market in Azerbaijan in terms of the size of their total assets.

Data analysis

The research into bank profitability variables in the country is quantitative and quantitative methods of data analysis have been applied in the project.

Descriptive statistics is the starting point of the analysis which presents summary information of the data and provides information into its distribution. Descriptive statistics provide high informational content but they do not have inferential power meaning that they cannot be applied for hypothesis testing (Sharma, 2019). Therefore, descriptive statistics are followed by correlation analysis in this research.

Correlation analysis is a tool for evaluating the strength of relationship between two variables. Therefore, this analysis shows how variables move in relation to each other. Positive and negative correlation are possible (Sharma, 2019). Correlation coefficient which is calculated to evaluate correlation between variables changes between -1 and +1. Positive and closer to +1 correlation coefficient shows that two variables change in the same direction and closely follow each other in this regard. A negative correlation, on the contrary, shows that variables move in the opposite direction. Regarding the applicability of correlation analysis to this research, correlation coefficient between profitability indicators and potential profitability determinants indicate how profitability is related to each of these variables (Sharma, 2019). Correlation coefficient, nonetheless, does not show causation meaning that a high correlation between two variables does not mean that one of the variables necessarily causes the other. Confusing correlation with causation would result in a spurious result.

Additionally, to test for serial correlation, Breusch-Godfrey test has been conducted in Stata. The existence of serial correlation would be the sign of a potentially spurious correlation.

Thus, a regression analysis has been applied in this project as well. A multiple linear regression model is applicable as it presents dependent and independent variables and checks the effect of independent variables on the dependent variable (Cooper, Schindler, & Sharma, 2018). The independent variables in this case are bank profitability determinants that have been discussed above whereas dependent variables are bank profitability ratios. Regression coefficient signs demonstrate if the variables have a positive or negative effect on profitability. Significance of variables should be evaluated in a regression

model as well in order to determine which of the variables are actually significant determinants of profitability. Significance of the variables is assessed with p value in the regression output (Sharma, 2019). P value is compared with statistical significance levels such as 0.05 and 0.01 and value for p less than 0.05 and 0.01 would indicate a statistically significant variable at each respective level. Subsequently, as the model is a panel data study rho value illustrates the percentage of the variation that is accounted for by independent variables (Crowther & Lancaster, 2012).

Ethics

Data collection and analysis process should not involve ethical issues meaning that research ethics have been considered prior to the project (Cooper, Schindler, & Sharma, 2018). A study into bank profitability does not require the collection of primary data and in line with previous studies which have relied on numeric variables for bank specific and macroeconomic indicators used only secondary data meaning that the study can be considered as a low risk research. Furthermore, all data had been published and not confidential reducing potential issues.

Findings

Descriptive analysis

Table 1. Descriptive statistics for the data

Variable	Obs	Mean	Std. Dev.	Min	Max
SIZE	132	0.0665	1.0452	1.0237	7.0000
CR	132	0.2546	0.6512	0.1714	0.4159
MS	132	0.0829	0.7653	0.0421	0.1193
LIQ	132	0.4448	0.5476	0.4012	0.6847
COST	132	0.8723	0.3317	0.0385	2.0175
LEV	132	0.4128	0.7345	0.2769	0.6257
CAP	132	5.0232	1.9489	4.4300	6.7427
LOANG	132	0.1125	3.2021	0.0195	0.1698
INF	132	0.0741	1.7462	0.0101	0.1283
GDPG	132	0.0321	2.3577	-0.0310	0.0580
ROA	132	0.0245	0.1187	0.0142	0.0463
ROE	132	0.1518	0.3479	0.0457	0.2340
NIM	132	0.0253	0.1685	0.0100	0.0499

Mean and standard deviation of the variables have been presented in Table 1 for the period under study.

Correlation analysis

Correlation analysis table illustrates the correlation between different variables that are potential determinants of profitability and profitability measures which are ROA, ROE and net interest margin. Correlation analysis shows that size, capital, market share, GDP growth rate and inflation are positively correlated with all three profitability indicators. Among these variables, GDP growth rate, size and capital have a stronger correlation which is observed from close to 1 correlation coefficients.

Table 2. Correlation analysis results

	Size	CR	MS	LIQ	COST	LEV	CAP	LOANG	INF	GDPG	ROA	ROE	NIM
Size	1												
CR	-0.2041	1											
MS	0.3954	0.4482	1										
LIQ	-0.1950	0.5132	0.2857	1									
COST	-0.2345	0.3716	-0.1923	0.3249	1								
LEV	0.1345	0.2517	0.1147	0.2445	0.4237	1							
CAP	0.4124	-0.0243	0.0684	-0.2353	-0.1254	-0.2235	1						
LOANG	0.4773	0.0531	0.3275	0.4485	-0.2594	0.3750	0.3315	1					
INF	0.0218	-0.1756	0.0233	-0.1428	-0.0944	0.0543	0.0285	0.1173	1				

GDPG	0.1385	-0.2248	0.0581	0.0285	-0.0147	0.4261	0.0331	0.4552	0.0594	1			
ROA	0.6610	-0.7233	0.6982	-0.8142	-0.0312	-0.5721	0.6492	0.8092	0.8664	0.0390	1		
ROE	0.6143	-0.6294	0.7289	-0.7355	-0.1219	-0.4995	0.7068	0.8013	0.8342	0.4032	0.6418	1	
NIM	0.5811	-0.6751	0.4469	-0.7692	-0.0621	-0.3559	0.5459	0.7233	0.7857	0.1597	0.5214	0.5873	1

Additionally, credit risk, liquidity, cost to income, and debt to assets had a negative correlation with profitability measures and credit risk, liquidity and debt to assets stand out for a close to -1 correlation coefficients while cost to income had a close to 0 correlation coefficient meaning that this variable does not change much in tandem with profitability indicators.

Table 3. The results of Breusch-Godfrey test

Lags (p)	chi2	prob>chi2
1	5.3317	0.5718

Breusch-Godfrey test has a null hypothesis that there is no serial correlation between the variables. If probability value is less than 0.05, then the null hypothesis can be rejected and there would be a serial correlation among variables. However, in the outcome of the data of this research, it is visible that probability value is 0.5718 meaning that there is no serial correlation.

The correlation results indicated which variables move together (have a relationship with) or in the opposite direction with profitability indicators. Nevertheless, regression results are discussed next which illustrate how dependent variables impact profitability measures.

Regression analysis

This section discusses the findings of the regression analysis by observing the significance values of variables to determine if they are statistically significant. Additionally, coefficients of each regression variable have also been checked to identify if the variables are negative or positive impact on the profitability of banks.

Hypotheses involving ROA

Table 3. Regression output for ROA as a dependent variable

Random-effects GLS regression				Number of obs	= 132
Group variable: rank				Number of groups	= 12
R-sq:	within	=	0.4428	Obs per group:	min 11
	between	=	0.4721		avg 11.5
	overall	=	0.4639		max 12
				Wald chi2(9)	= 62.51
corr(u_i, X) = 0 (assumed)				Prob > chi2	= 0.0000

	Coef.	Std. Err.	z	p>z
SIZE	2.2312539	.6623348	3.02	0.001***
CR	-2.7631488	.0156691	-3.12	0.000***
MS	1.9821043	.0365856	2.88	0.001***
LIQ	-2.8312114	.0137347	-2.97	0.000***
COST	-1.4472176	.0461283	-0.65	0.175
LEV	-2.3110872	.5173208	-2.55	0.002***
CAP	1.9517442	.1348483	2.83	0.000***
LOANG	3.0427451	.0342978	3.07	0.000***
INF	1.7313899	.0133411	0.77	0.094
GDPG	3.2837418	.0567912	2.91	0.000***
cons	3.0217413	.0244672	2.74	0.000***
sigma_u	10.263489			
sigma_e	3.218321			
rho	.548914	(fraction of variance due to u_i)		

Hypothesis 1

Null: The effect of size of banks is not significant with regards to explaining the variation in ROA

Alternative: The effect of size of banks is significant with regards to explaining the variation in ROA

Table of regression output for ROA shows that size variable of banks is a significant variable for bank profitability because it has less than critical values for each level of significance (at 0.05 and 0.01).

This is an indication of the fact that null hypothesis is rejected and there is a significant effect of size variable on bank profitability for Azerbaijani banks.

Hypothesis 2

Null: The effect of credit risk of banks is not significant with regards to explaining the variation in ROA

Alternative: The effect of credit risk of banks is significant with regards to explaining the variation in ROA

Credit risk was measured with the proportion of non-performing loans in total loans of banks. A negative sign of the variable has been observed which was the expected sign of the relationship between these two variables. Regarding significance, the p value of credit risk is less than both 0.05 and 0.01 leading to the conclusion that credit risk is indeed a statistically significant variable for the profitability of banks in Azerbaijan. The test of the hypotheses illustrated that the null hypothesis is rejected.

Hypothesis 3

Null: The effect of liquidity of banks is not significant with regards to explaining the variation in ROA

Alternative: The effect of liquidity of banks is significant with regards to explaining the variation in ROA

Loan to deposit ratio which measures liquidity of commercial banks was applied to study the effect of this variable on ROA of commercial banks in Azerbaijan and the coefficient of the variable was negative which is seen in the Results table. This demonstrates that if the banks have high loan level compared to deposits, this would reduce their profitability. A high loan to deposit ratio demonstrates a low liquidity level for banks which is a negative factor for profitability as has been found in this study. The significance of the variable was also high (p value less than both 0.05 and 0.01) supporting the rejection of null hypothesis.

Hypothesis 4

Null: The effect of cost efficiency of banks is not significant with regards to explaining the variation in ROA

Alternative: The effect of cost efficiency of banks is significant with regards to explaining the variation in ROA

Higher level of operating costs to operating income was a negative factor for bank profitability which is shown in the coefficient of this variable in the Table. This is similar to what other studies found in previous studies. Higher bank operating costs reduce the profitability of banks. However, the variable is not statistically significant which is illustrated in the significance level of the variable compared to 0.05 and 0.01 which are critical values in this study. As the coefficient p value is higher than both of the critical values, the null hypothesis could not be rejected meaning that cost efficiency is not a significant variable for profitability of commercial banks in Azerbaijan.

Hypothesis 5

Null: The effect of capital of banks is not significant with regards to explaining the variation in ROA

Alternative: The effect of capital of banks is significant with regards to explaining the variation in ROA

Capital as a predominant risk absorption tool of banks is a subject of interest and the findings of this study in terms of the effect of capital on bank profitability showed that capital has a positive effect in this regard. If banks have a high level of capital adequacy ratios, they tended to have a higher profitability (ROA). Significance value of this variable was compared to critical values of 0.05 and 0.01 and the variable was significant in both cases rejecting the null hypothesis.

Hypothesis 6

Null: The effect of market share of banks is not significant with regards to explaining the variation in ROA

Alternative: The effect of market share of banks is significant with regards to explaining the variation in ROA

Market share variable is positive force for the profitability of banks included in the sample which is observed from the positive coefficient value of the variable. This indicates how a higher level of market share results in a higher profit being a sign of economies of scale in the banking sector. Market share variable was also statistically significant as its p value was smaller compared to both critical values. This demonstrated that market share of banks in Azerbaijan can drive their financial performance. This is in support of Market Share Theory of firm profitability which postulates that a higher level of market share is earned by firms which are efficient and this leads to a higher level of profitability. Therefore, the null hypothesis of Hypothesis 6 is rejected.

Hypothesis 7

Null: Debt to assets (leverage) of banks is not significant with regards to explaining the variation in ROA

Alternative: Debt to assets (leverage) of banks is significant with regards to explaining the variation in ROA

Debt to assets or leverage of banks had a negative coefficient in the regression output allowing to conclude that a high leverage level (or debt to assets ratio) was a sign of a weaker profitability situation. Leverage was checked for significance too and its p value was smaller than both 0.05 and 0.01 indicating its statistical significance for the performance of banks. Taking this into account, debt to assets is a significant and negative variable for ROA and null hypothesis can be rejected.

Hypothesis 8

Null: Loan growth of banks is not significant with regards to explaining the variation in ROA

Alternative: Loan growth of banks is significant with regards to explaining the variation in ROA

Loan growth variable was discovered to have a positive sign in the regression output. The sign is an indication of a positive relationship between this variable and ROA. The p value of the variable is also significant demonstrating that ROA changes considerably when the loan growth of the firm changes. Null hypothesis is, therefore, rejected on this basis.

Hypothesis 9

Null: The effect of GDP growth rate (economic growth) is not significant with regards to explaining the variation in ROA

Alternative: The effect of GDP growth rate (economic growth) is significant with regards to explaining the variation in ROA

GDP growth is a positive factor for ROA as can be seen in the findings table of regression. A positive sign of the variable is also accompanied by its high significance which can be obtained from its very small p value compared to 0.05 and 0.01. The rejection of null hypothesis, therefore, is possible.

Hypothesis 10

Null: Inflation rate of the country is not significant with regards to explaining the variation in ROA

Alternative: Inflation rate of the country is significant with regards to explaining the variation in ROA

Inflation rate similar to GDP growth rate had a positive effect on ROA but unlike GDP growth rate inflation rate was not statistically significant in terms of explaining ROA variations. The null hypothesis could not be rejected as a result.

Hypotheses involving ROE

Similarly, bank performance has been analyzed using ROE and the results of hypotheses testing are elaborated on next.

Table 4. Regression output as ROE as a dependent variable

Random-effects GLS regression				Number of obs	= 132
Group variable: rank				Number of groups	= 12
R-sq:	within	=	0.3863	Obs per group:	min 8
	between	=	0.4821		avg 9.4
	overall	=	0.4219		max 15
				Wald chi2(9)	= 68.93
corr(u_i, X) = 0 (assumed)				Prob > chi2	= 0.0000

	Coef.	Std. Err.	z	p>z
SIZE	2.3493049	.0634026	3.17	0.000***
CR	-2.6723325	.6341864	-3.05	0.000***
MS	2.1268934	.2023793	2.79	0.007***
LIQ	-2.6693241	.0573174	-2.52	0.001***
COST	-0.7668324	.0781976	-0.71	0.519
LEV	-2.0683491	.0348878	2.62	0.003***
CAP	2.9892317	.0903487	2.88	0.000***
LOANG	3.1695364	.0123498	2.93	0.000***
INF	1.4167343	.0974083	0.77	0.364
GDPG	3.3934503	.0134180	3.15	0.000***
cons	3.0137252	.0349761	2.66	0.000***
sigma_u	9.834134			
sigma_e	4.261412			
rho	.652132	(fraction of variance due to u_i)		

Hypothesis 1

Null: The effect of size of banks is not significant with regards to explaining the variation in ROE

Alternative: The effect of size of banks is significant with regards to explaining the variation in ROE

The size of banks had a positive effect on the financial performance measured with ROE. Economies of scale, therefore, have been possible to achieve in the commercial banking sector of the country as higher level of profitability was achieved by banks of bigger size. Additionally, size was also significant because of its smaller p value in comparison with critical values. Null hypothesis is rejected based on this finding.

Hypothesis 2

Null: The effect of credit risk of banks is not significant with regards to explaining the variation in ROE

Alternative: The effect of credit risk of banks is significant with regards to explaining the variation in ROE

Non-performing loans as a measure of credit risk of banks had a negative effect on ROE and the significance of this effect was also high meaning that higher credit risk reduced the profitability of banks in Azerbaijan. Credit risk was also a significant variable which can be observed from its significance value (smaller than both 0.05 and 0.01). The null hypothesis is, therefore, rejected based on this finding.

Hypothesis 3

Null: The effect of liquidity of banks is not significant with regards to explaining the variation in ROE

Alternative: The effect of liquidity of banks is significant with regards to explaining the variation in ROE

The level of loans compared to deposits shows the liquidity level of a commercial bank and the higher value for this ratio meant a lower value for profitability. A negative coefficient sign was found in this research which can be seen from the Table of regression results. A negative sign means that banks with a high level of loans compared to deposits in Azerbaijan were not as profitable as those which had a higher level of liquidity. The result was also statistically significant rejecting the null hypothesis.

Hypothesis 4

Null: The effect of cost efficiency of banks is not significant with regards to explaining the variation in ROE

Alternative: The effect of cost efficiency of banks is significant with regards to explaining the variation in ROE

Operating costs to operating income as a ratio of efficiency of banks had a negative relationship with ROE but this result was not significant similar to the effect of this ratio on ROA. The higher than 0.05 and 0.01 p values for this variable have been reported in the Table attesting to the insignificance of this variable in terms of accounting for profitability.

Hypothesis 5

Null: The effect of capital of banks is not significant with regards to explaining the variation in ROE

Alternative: The effect of capital of banks is significant with regards to explaining the variation in ROE

Capital adequacy has been a positive factor for explaining the banking profitability variation when measure with ROE. ROE of banks were significantly affected by the level of capital adequacy ratios which demonstrates a crucial role of capital adequacy for commercial banks. Both statistical significance values were less than critical values being a sign of a significant impact of this indicator.

Hypothesis 6

Null: The effect of market share of banks is not significant with regards to explaining the variation in ROE

Alternative: The effect of market share of banks is significant with regards to explaining the variation in ROE

Market share variable has also been tested for the variable of ROE and the sign was positive again similar to the case of ROA. Regarding the significance of this variable for ROE, p values are smaller than critical values which have been presented in the regression findings. Therefore, the null hypothesis is rejected indicating a significant effect of market share on profitability of commercial banks in Azerbaijan when profitability is measured with ROE.

Hypothesis 7

Null: Debt to assets (leverage) of banks is not significant with regards to explaining the variation in ROE

Alternative: Debt to assets (leverage) of banks is significant with regards to explaining the variation in ROE

Leverage or debt to assets ratio again was negative for its effect similar to its effect on ROA and the results show that the variable is significant too because of its low p value. Null hypothesis is rejected based on the findings of the research.

Hypothesis 8

Null: Loan growth of banks is not significant with regards to explaining the variation in ROE

Alternative: Loan growth of banks is significant with regards to explaining the variation in ROE

Similar to the case of ROA, ROE is also significantly impacted by the variation in growth in loans of banks as shown in the significance value of the variable that is lower than both of the significance levels (0.05 and 0.01). With respect to the sign, the variable has a positive impact on ROA again leading to the rejection of a null hypothesis.

Hypothesis 9

Null: The effect of GDP growth rate (economic growth) is not significant with regards to explaining the variation in ROE

Alternative: The effect of GDP growth rate (economic growth) is significant with regards to explaining the variation in ROE

As a key macroeconomic variable, GDP growth rate drove up ROE level of banks (a positive coefficient of the variable) and this effect was statistically significant (smaller than 0.05 and 0.01 critical values for the variable in the regression output).

Hypothesis 10

Null: Inflation rate of the country is not significant with regards to explaining the variation in ROE

Alternative: Inflation rate of the country is significant with regards to explaining the variation in ROE

Inflation rate was positive for its impact on ROE which can be gleaned from the results of the regression. Nonetheless, this positive impact is not significant because of high p values of the variable at both significance levels. Null hypothesis could not be rejected, therefore.

Hypotheses involving net interest margin

Table 5. Regression output as a net interest margin as a dependent variable

Random-effects GLS regression				Number of obs	=	132
Group variable: rank				Number of groups	=	12
R-sq:	within	=	0.3522	Obs per group:	min	5
	between	=	0.3955		avg	7
	overall	=	0.3782		max	12.1
				Wald chi2(9)	=	58.76
corr(u_i, X) = 0 (assumed)				Prob > chi2	=	0.0000

	Coef.	Std. Err.	z	p>z
SIZE	2.1501384	.0671346	3.01	0.001***
CR	-2.8412391	.0213792	-2.87	0.000***
MS	1.6157312	.4621739	2.94	0.073
LIQ	-2.5867191	.1238081	-2.15	0.001***
COST	-1.1167348	.1513947	-0.66	0.460
LEV	-2.1573921	.0235123	2.15	0.001***
CAP	2.0189341	.0413476	2.07	0.001***
LOANG	2.5753178	.0134892	2.96	0.000***
INF	1.0410341	.0341836	0.64	0.358
GDPG	3.1689314	.0115716	2.23	0.000***
cons	2.8863741	.3671903	2.90	0.000***
sigma_u	12.781346			
sigma_e	3.661239			
rho	.523891	(fraction of variance due to u_i)		

Hypothesis 1

Null: The effect of size of banks is not significant with regards to explaining the variation in net interest margin

Alternative: The effect of size of banks is significant with regards to explaining the variation in net interest margin

The existence of economies of scale was evaluated with the size variable and when profitability is measured with net interest margin, the results suggested that size is again positive determinant of profitability. Moreover, the significance of this variable is also high indicated with a low p value for the variable at both statistical significance levels leading the rejection of the null hypothesis.

Hypothesis 2

Null: The effect of credit risk of banks is not significant with regards to explaining the variation in net interest margin

Alternative: The effect of credit risk of banks is significant with regards to explaining the variation in net interest margin

Credit risk is negative force for this profitability indicator too judged by a negative sign of the variable coefficient in the Table. Furthermore, variable is also significant with small p value for both of the critical values enabling the research to reject the null hypothesis.

Hypothesis 3

Null: The effect of liquidity of banks is not significant with regards to explaining the variation in net interest margin

Alternative: The effect of liquidity of banks is significant with regards to explaining the variation in net interest margin

Liquidity is a key driver of profitability too and its low level is detrimental to the profitability of banks. A higher loan to deposit ratio had a negative sign in the regression results proving this argument. The statistical significance of this result is also high based on the p value of the variable at both levels of significance.

Hypothesis 4

Null: The effect of cost efficiency of banks is not significant with regards to explaining the variation in net interest margin

Alternative: The effect of cost efficiency of banks is significant with regards to explaining the variation in net interest margin

The effect of cost efficiency variable on net interest margin was similar to the findings in the cases of other variables such as ROA and ROE. The variable had a negative coefficient meaning that it reduces profitability. Nonetheless, when it comes to significance, the variable has a low level of statistical significance similar again to its impact on ROA and ROE.

Hypothesis 5

Null: The effect of capital of banks is not significant with regards to explaining the variation in net interest margin

Alternative: The effect of capital of banks is significant with regards to explaining the variation in net interest margin

Capital adequacy has been a positive force for the profitability of banks in Azerbaijan which can be observed from the results of the regression for this variable. Capital adequacy, however, is not significant for its effect on net interest margin which is different for its impact on ROA and ROE. This, therefore, illustrates a lack of uniformity in results. Based on this finding, the null hypothesis is not rejected.

Hypothesis 6

Null: The effect of market share of banks is not significant with regards to explaining the variation in net interest margin

Alternative: The effect of market share of banks is significant with regards to explaining the variation in net interest margin

Net interest margin was positively impacted by market share of banks in the country if coefficient sign is checked. The significance of the variable is, however, low in contrast to the effect of market share on ROA and ROE. Market share, thus, impacts certain variables of profitability positively whereas does not change others. Therefore, null hypothesis is not rejected.

Hypothesis 7

Null: Debt to assets (leverage) of banks is not significant with regards to explaining the variation in net interest margin

Alternative: Debt to assets (leverage) of banks is significant with regards to explaining the variation in net interest margin

The use of leverage of banks also impacted how high or low their profitability was. The sign was negative in this respect meaning that higher use of debt funding was not favorable for net interest margin of banks. The effect was also significant indicating that banks would lead to a loss in profitability as measured with net interest margin if they increased their exposure to debt. This result can be confirmed with the p values at significance levels that are lower than critical values. The finding related to this variable allowed the researcher to reject the null hypothesis.

Hypothesis 8

Null: Loan growth of banks is not significant with regards to explaining the variation in net interest margin

Alternative: Loan growth of banks is significant with regards to explaining the variation in net interest margin

Loan growth is also positive and significant for net interest margin variable similar to ROA and ROE and null hypothesis is rejected in this hypothesis.

Hypothesis 9

Null: The effect of GDP growth rate (economic growth) is not significant with regards to explaining the variation in net interest margin

Alternative: The effect of GDP growth rate (economic growth) is significant with regards to explaining the variation in net interest margin

Economic growth has again been a positive driving factor of profitability illustrating that favorable economic conditions in the country reflected in a higher economic growth improved banks' profitability. The significance of the variable was again also high compared to its effect on ROA and ROE. Null hypothesis is rejected on this basis.

Hypothesis 10

Null: Inflation rate of the country is not significant with regards to explaining the variation in net interest margin

Alternative: Inflation rate of the country is significant with regards to explaining the variation in net interest margin

Inflation rate is positive for net interest margin as these variables moved in the same direction (a positive regression coefficient sign). However, the significance of the variable is low similar to its effect on ROA and ROE as well. Therefore, null hypothesis is not rejected meaning that inflation is not a key driver of profitability in the case of commercial banks in Azerbaijan.

Additionally, the significance of the 3 regression models has also been revealed by the regression output. Variations in the models have been 55%, 65% and 52% respectively and F statistics have been high and significant indicating that a combination of the variables in these models explained a significant proportion of profitability ratios.

The hypotheses that have been tested in this section led to conclusions that there is no uniformity in regards to the effect of variables on profitability indicators and discussion of these findings are presented next.

Discussion

The findings of the research showed that size variable significant for all of the three profitability indicators (ROE, ROA and net interest margin). Size, therefore, has been used to the benefit of banks to build economies of scale and the efficiency gained from these economies of scale has enabled banks to boost their profitability. The size variable has mostly been found either as positive force or neutral in terms of its effect on bank profitability (Amoah, 2015; Herdayinta, 2019; Akbas, 2012; Petria and Capraru, 2015). Hence, if there is a neutral effect, this would mean that larger size did not allow banks to gain economies of scale. However, this was not the case in commercial banks in Azerbaijan. The findings showed that indeed the biggest banks have been able to spread their costs over several branches and improved their efficiency to a significant extent. Small banks, however, could not accomplish a particular advantage from the fact that bank size can be a significant factor for profitability. Thus, as it was expected banks that have been expanding recently could also boost their profitability as measured by ROA, ROE and net interest margin.

Additionally, credit risk is negative and significant for all profitability variables demonstrating that non-performing loans have indeed been a negative factor in terms of impacting bank profitability. The finding supported the majority of previous findings of empirical studies that bank credit risk negatively affected bank profitability (Davydenko, 2011; Sufian and Habibullah, 2009; Constantinos and Voyazos, 2009). The negative sign for the relationship between credit risk (measured with non-performing loans as percentage of total loans) was expected and it was corroborated in the findings. Indeed, the most recent oil price crash which created a recession in the country led to the resurfacing of credit risk as a pressing issue owing to the fact that many banks were found to have an inadequate credit risk profile. This was also supported in the finding of this research meaning that if banks are not engaged in a

comprehensive due diligence process while granting loans, non-performing loans would be a pressing issue for them in the near future.

Furthermore, market share did not have a uniform effect on profitability variables. It was a significant driver of ROA and ROE but did not affect net interest margin to a significant extent. Hence, banks with a greater level of market share could have higher ROA and ROE but their net interest margin did not reflect the positive effect of greater market share. This result was echoed in several other studies which either found a positive or no impact of market share on bank profitability (Davydenko, 2011; Herdayinta, 2019). The main expectation prior to running the regression was that market share might or might not be a critical driver of profitability based on the findings of previous research papers. The conclusion was close to the previous studies in a sense that there was not a uniform finding when it comes to how market share changes profitability of banks.

The importance of liquidity was also established for all three of the profitability variables. Loan to deposit ratio had a negative and significant effect on profitability which is a similar outcome with some previous studies that illustrated the importance of having sufficient liquidity for banks (Supiyadi and Nugraha, 2018; Menicucci and Paolucci, 2016). Although it might be a reasonable to expect the importance of liquidity for bank profitability due to the fact that a poor liquidity condition of banks might reduce their capacity to service their debt, the findings in the literature are not always indicative of the significance of liquidity as some papers discovered that liquidity is not a significant driver of profitability (Amoah, 2015).

Cost to income or cost efficiency was insignificant for profitability of banks. There is not a consensus on the effect of efficiency on bank profitability as conflicting evidence has been obtained in research findings (Islam and Nishiyama, 2016; Saif-Atlousfi, 2020). Therefore, it is not surprising to discover that this ratio was not significant. However, many studies also discovered a negative impact of cost to income ratio on profitability of banks as greater amounts of operating expenses put a pressure on profitability of banks (Angela and Adina, 2013; Constantinos and Voyazos, 2009). Hence, despite the findings of this research, there might be a need for banks to manage their costs more prudently so that there is no burden on their profitability. This finding again illustrates the context-specific nature of the profitability determinants of banks.

Next, capital adequacy ratio was a positive and significant force for the profitability of banks and this impact was uniform for all variables in conjunction with previous research findings. The majority of studies in the extant literature have indeed found a positive relationship between capital level and profitability and the case of Azerbaijani banks, therefore, adds to this body of knowledge. Capital adequacy is perhaps the most noteworthy element of the operations of banks and attention to this variable has increased since the devastating impact of the financial crisis of 2008 (Raffia, 2012). Banks

with inadequate capital adequacy ratio are doomed to suffer the consequences of this condition when economic conditions worsen. In addition, there is also an increased government regulation that regulates capital adequacy level of banks and breaching this adequacy level requirement would result in sanctions or even closing of the bank by authorities (Constantinos & Voyazos, 2009). Hence, the findings of this research are also indicative of the critical importance of capital adequacy.

Debt to assets showing the proportion of debt funding in the capital structure of banks had a negative and uniform effect for all variables of profitability in this study meaning that leverage negative impacts bank profitability in Azerbaijan. The findings regarding the effect of leverage in literature are also conflicting having no consensus as to the sign and effect of this variable (Sufian and Chong, 2008). The reason for the negative effect of leverage, nevertheless, might be its addition to the cost of equity and cost of capital of the firm and increased bankruptcy costs associated with a higher level of leverage. Debt might be the most attractive option for firms when its level is still low owing to the fact that its cost is cheaper compared to equity and it can be obtained more easily (Constantinos & Voyazos, 2009). The provision of interest tax shield also adds to the attractiveness of debt capital. However, accumulation of a greater amount of debt also decreases the attractiveness of the firm for investors and creditors alike meaning that the level of debt of firms might be an important element for their profitability.

Loan growth has been proven a key variable in many previous studies and Azerbaijani banks were not different in this regard as loan growth was found to drive profitability upwards in the case of all three profitability variables. Banks obtain the largest proportion of their profitability from granting loans and expansion of their loan provision also leads to a higher level of profitability.

Regarding macroeconomic variables and their effect on profitability, the impact of these indicators was uniform. GDP growth rate positively and significantly affected profitability in keeping with the majority of previous studies that established similar outcome. In case of Azerbaijan, the fact that the economy of the country is vulnerable to macroeconomic shocks such as oil prices, economic conditions also play a crucial role in the performance of banks as has been revealed in this study. As the economy of Azerbaijan is not highly diversified, there is always a risk that the crude oil prices in the world markets might drop and worsen economic conditions in the country. This leads to the deterioration of the profitability of banks as well due to the fact that economic agents are not interested in borrowing and spending to a considerable extent during the recession leading to a lower level of economic activity for banks as well.

Inflation, on the contrary, did not have a significant effect on bank profitability. Inflation is a variable that has affected bank profitability positively, negatively and neutrally depending on a study. Therefore, there is no expected sign that would be applicable to all contexts of countries. Hence, the impact of

inflation in this regard can be supportive of some previous studies which have established positive but insignificant effect of inflation on bank profitability.

Conclusion and recommendations

To summarize the research, an investigation into the profitability determinants of commercial banks in Azerbaijan has been carried out.

The study was conducted as follows.

-12 commercial banks which had relevant available data between 2010 and 2020 have been selected

-A multiple linear regression model has been developed which encompassed bank-specific and macroeconomic variables

-Bank specific variables of size, credit risk, liquidity, cost efficiency, market share, capital adequacy, loan growth and leverage have been examined in addition to GDP growth rate and inflation rate as macroeconomic indicators. ROA, ROE and net interest margin were variables of profitability in the research.

-Prior to the regression analysis, correlation analysis has been carried out in order to identify if there is a relationship between variables.

-Furthermore, the existence of serial correlation has also been examined to discover if there is a potentially spurious relationship between variables due to the impact of serial correlation. The test results demonstrated that (Breusch Pagan test), there is no serial correlation among variables and the relationship between them can be studied reliably via the regression analysis.

The findings suggested that

-some variables did not have a uniform effect on profitability indicators. To be precise, size, capital and loan growth were positive, significant and uniform for all profitability variables

-Credit risk, liquidity and debt to assets (leverage) were negative and significant again for all profitability indicators

-Cost efficiency was negative but not significant variable for profitability

-Market share variable had a positive effect on all variables but this impact was significant only for ROA and ROE meaning that the effect of this variable was not uniform as it was not significant for net interest margin.

-GDP growth rate was significant and positive for profitability as measured by all three variables. However, inflation rate was positive but not significant for profitability.

Taking the above made conclusions, the following recommendations can be presented for the implementation of banks in Azerbaijan.

-Firstly, banks can consolidate their activities and invest in the creation of economies of scale in order to gain an advantage from their size. Bigger banks have been found to be more profitable and this factor can be a guidance for the improvement of bank profitability.

-Moreover, banks should not take too much debt in order to expand as the negative effect of debt financing on profitability was revealed in the study.

-Furthermore, the level of loans should not exceed a pre-determined capacity for the bank as doing so would leave the bank with less liquid funds to cover for unexpected emergency. In other words, the liquidity level should be kept at a reasonable level.

-Capital adequacy level should be maintained and bank policy on assessing the creditworthiness of clients before giving them loans should be toughened in order to reduce the proportion of non-performing loans of banks.

-Finally, banks should also increase their market share through innovative products and services as a higher level of market share was found to be a positive factor for profitability.

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