Charles University

Faculty of Social Sciences
Institute of Economic Studies

MASTER'S THESIS

An Application of Islamic Banking Principles in Azerbaijan

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Declaration of Authorship

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Prague, May 10, 2019

Signature

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Last but not least, I would also like to thank my family and friends for their unconditional love and support.

Abstract

This master thesis examines key differences between Islamic and conventional banks. We use a data on 2374 banks from 47 countries for the 2010-2016 period. We apply comparative statistical analysis, Ordinary Least Squares regression and System Generalized Method of Moments to estimate the effects of both bank types on their profitability and stability. The contribution of the thesis is threefold. First, we find a significantly higher profitability of Islamic banks compared to conventional ones. Second, we did not find any evidence that Islamic banks are less stable. Finally, we conclude that the women participation in financial activities is correlated with the development of conventional, not Islamic, banks

JEL Classification	G21, C33, F33, F34, J11
Keywords	Islamic banking, bank profitability, bank stability, gender participation

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Abstrakt

V této diplomové práci jsou analyzovány klíčové rozdíly mezi islámskými a konvenčními bankami. Dále jsou diskutovány hlavní principy islámského bankovnictví v různých zemích. Prostřednictvím statistické analýzy a analýzy GMM jsou vyhodnoceny tři hypotézy. Výsledky ukazují, že islámské banky jsou v průměru ziskovější a stabilnější než konvenční banky. Zároveň byl prokázán negativní vztah mezi participací žen v bankovních službách a mírou penetrace islámského bankovnictví v dané zemi..

Klasifikace	G21, C33, F33, F34, J11
Klíčová slova	Islamic banking, bank profitability, bank stability, gender participation

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Acronyms

AAOIFI	The Accounting and Auditing Organization for Islamic Financial Institutions
ASEAN	Association of Southeast Asian Nations
GCC	Gulf Cooperation Council
GMM	Generalized method of moments
IDB	Islamic Development Bank
IFSB	the Islamic Financial Services Board
IIFM	International Islamic Financial Market
PER	Profit Equalization Reserves
PLS	Profit and loss sharing
ROA	Return on Assets
ROE	Return on Equity

Master's Thesis Proposal

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Proposed Topic:

An Application of Islamic Banking Principles in Azerbaijan

Motivation:

Azerbaijan is an oil producing country that has shown a sustainable economic growth since its independence from the Soviet Union in 1992. However, recent financial crisis and the later drop in the oil prices have negatively affected the economic stability of the country. Azerbaijani economy is heavily dependent on oil and natural gas exports but prices have significantly decreased in recent years. As the result, the Central Bank of Azerbaijan subsequently devalued Azeribaijani Manat by 34% in February, 2015 mainly with the purpose of ensuring non-oil competitiveness. In December 2015 the Central Bank of Azerbaijan made another dramatic 32% currency devaluation. As the result, many enterprises, NGOs and even some banks had to terminate their operations and close.

While vast majority of Azerbaijani population are Muslims, Islamic Finance and Banking is becoming a very important part of the world financial system. However, it is still unexplored by the Azerbaijani banking representatives. Islamic Banking is a banking system based on Sharia (Islamic law). Due to the fact that Islamic banking is based purely on Islamic principles, all of the transactions undertaken by the banks strictly follow Islamic morals.

As Islamic Finance is gaining its popularity worldwide, this thesis will assess Islamic banking in terms of profitability and stability. The comparative analysis between the conventional and Islamic banking will be made.

This thesis's main purpose is to compare the performance of Islamic banks versus other banks in terms of profitability and its volatility and stability. Moreover, this thesis will evaluate how significant is the relation between gender, religion and a holding of Islamic bank account. Also, this thesis will bring up and discuss the potential effects of Islamic banking application on the Azerbaijani banking system.

Hypotheses:

1. Hypothesis #1: Islamic banks report higher profitability than other banks

2. Hypothesis #2: Islamic banks are less stable than other banks.

3. Hypothesis #3: The level of women participation in financial activities of Muslim countries depends on the degree of Islamic banking penetration

Methodology:

The thesis will mainly focus on profitability and its volatility through different time and bank groups. Stability will be measured via Z-score and profitability will be assessed via Return on Equity. The thesis will also test a relation between such socio-demographic factors as gender, religion and the fact that a person is using Islamic banking services. The thesis will cover a time period from the beginning of the 21st century to ensure that the data is recent and adequate. BankScope database and annual reports will be used as the main data sources.

Hypotheses will be tested by the GMM estimators.

Expected Contribution:

The topic of Islamic Banking application in Azerbaijan has never been academically discussed before. Thus, upon a completion, this thesis will be of a high value for Azerbaijani central and other banks as they can refer to it in the questions related to Islamic banking application profitability.

Outline:

1. Introduction
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   3.1 Data and variables
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Author **Supervisor**

1. Introduction

In recent years, the interest towards Islamic banking in academic literature rapidly increased. Many scholars investigate such features of Islamic banks as profitability (Rana, M, Hossain, K, & Rekha, RS, 2016; Aman, A, Sharif, S, & Imtiaz, A ,2016) and stability (Čihák, M. and Hesse, H., 2016; Farooq, M .& Zheer S., 2015) versus conventional banks. The mentioned papers show that Islamic banks on average are more profitable and less stable than conventional ones.

The objective of this master thesis is to provide an evidence of key differences between Islamic and conventional banks in terms of profitability and stability together with dependence between Islamic banking penetration and gender. For doing this, we stated three hypotheses: the first one states that Islamic banks report higher profitability than other banks. The second one assumes that Islamic banks are less stable than other banks. Finally, the third hypothesis states that women participation in financial activities depends on the degree of Islamic banking penetration.

We state these hypotheses to answer the question whether it is reasonable to apply Islamic banking principles in Azerbaijan in order to maintain higher profitability and stability of Azerbaijani banking system. Our findings might provide the evidence to policymakers and support their decisions to introduce Islamic banks in Azerbaijan. In addition, our findings can show whether Islamic banking is able to contribute a broader participation of women in banking services and financial activities in Azerbaijan.

The thesis is structured as follows: Chapter 2 provides general overview of Islamic banking including its development, key features, principles, products and market share analysis. Chapter 3 contains the results of empirical research: the description of data, outline of methodology used, results of statistical and GMM analyses and assessment of hypotheses stated. In Chapter 4 we provide conclusions to the master thesis, discuss potential limitations and give possible extensions for the future research.

2. Theoretical Background

2.1. Introduction to Islamic Banking

2.1.1. Evolution of Islamic Banking

The 21st century is a highly globalized historical period characterized by a very rapid technological development. Many significant scientific discoveries expanding limits of human capabilities have recently been made. Globalization is probably the most intense process-taking place nowadays. However, some Muslim elite representatives believe that particular values as materialism and sex popularized by globalization are not in line with Muslim principles. Despite this, Muslims understand that all of the progressive achievements of the Western world still cannot be neglected (Najjar, 2005, pp. 95-96). Thus, instruments to utilize the progressive achievements of the Western world to the fullest without breaking the Islamic principles are constantly being explored. Islamic banking can be considered as one of such instruments allowing a complete utilization of services provided by conventional banks within the limits of Islamic laws and traditions.

The main aim of Islamic banking is to apply Islamic economic principles to a real world. These principles include elimination of interests and other unfair elements from the economies. Islamic banking provides a platform for such activities as borrowing, lending and investing (Shahzad, Zia, Ahmed, Fareed & Zulfigar, 2014, p.216).

Despite the fact that Islamic finance is globally perceived as an innovative, it is actually as old as Islam itself. Sharia, the Islamic law, takes central place in the Islamic banking due to the fact that it aligns banking activities in line with verses from Quran and other

sacred sources. Thus, the Islamic banking operates only through acceptable by Quran processes, neglecting such prohibited sources of income as interest (Riba), unethical trade operations and business activities connected with prohibited actions such as consumption of alcohol (Naveed, 2015a, The Quran and Islamic Economics section, para. 1).

The first economic transactions processed in conduct with Islamic principles are recorded as early as in the Middle Ages. The trigger for flourishing Islamic commerce that time was the establishment of trade routes from Gibraltar to the Sea of China that were managed in accordance with the Islamic traditions (Naveed, 2015a, The Golden Age of Islamic Civilisation section, para. 1&2).

Back in that time some crucial financial tools were created and frequently used. For instance, bill of exchange and letter of credits were created in established trade processes. Such financial tools as credit transactions, double-entry bookkeeping, principles of ledger accounting, auctions and futures-trading were used already in the Middle Ages (Ghazanfar, n.d., Development of Financial Capitalism section, para. 2).

The Islamic banking industry has started its rapid development already in 1940s. Eventually, it grew into an applicable model that enabled an establishment of several Islamic banks (Shahzad, Zia, Ahmed, Fareed & Zulfigar, 2014, p. 216). Nasser Social Bank Cairo (NSBC), the first interest free institution with functions of a bank, was established in 1970. This bank was established with a significant government support and its main goals were socially oriented; for instance, NSBC provided scholarships to students in need, interest-free loans to the poor and micro-credits to some specific

projects based on profit and loss sharing (PLS) terms. Despite its small scope of operations, the establishment of such an institution with a strong governmental support created powerful initiatives for wealthy businessman. As the result, a group of such businessman decided to establish the Dubai Islamic Bank, the first private Islamic institution, in 1975. The official support of UAE and Kuwait governments was again crucial in this case and constituted 20% and 10% respectively in terms of capital contribution. This event was followed by an establishment of Islamic Development Bank (IDB) in 1975, which is considered to be one of the most crucial events in the history of Islamic financial development. The IDB was established by member states of the Organization of the Islamic Conference. The main objective of the IDB is a constant development of Muslim economies in line with Sharia principles. IDB has played a role of not only a significant financier but also a protagonist of an integration of financial instruments into Islamic financial systems (Abedifar, Ebhrahim, Molyneux & Tarazi, 2015, p. 639).

Later in 1977 Kuwait Finance House, “best Islamic financial institution in GCC of 2016” award winner, was established (“Ratings and Awards”, 2016). Faisal Islamic Bank of Sudan aimed at the promotion of international trade in compliance with Sharia principles was created the same year (‘Basic Information”, n.d.). Dar Al-Maal Al-Islami, leading Islamic financial institution, was established in 1981 and its headquarter is located in Switzerland (“Company Overview of Dar Al-Maal Al-Islami, n.d.).

The Accounting and Auditing Organization for Islamic Financial Institutions (AAOIFI) that is based in Bahrain has been issuing Islamic auditing and accounting standards for

financial reporting processes in compliance with Sharia principles since 1991 (Hussain, Shahmoradi & Turk, 2015, p. 4).

Overall, there was a significant development of Islamic financial institutions in the period between 1975 and 1990. It happened mainly due to the fact that numerous Islamic financial institutions in private sector were created during that period. Moreover, three countries' authorities reported their objective to fully eliminate interests from their economies and base all of the financial transactions on Sharia principles. Already in 1983 and 1984 Iran and Sudan respectively announced about fully integrating their economies (Abedifar, Ebhrahim, Molyneux & Tarazi, 2015, p. 639). In August of 1983 a new law was passed in Iran replacing all conventional banking activities with interest-free banking activities. The law also allowed all of the existing banks to fully switch their systems to ones with no interest involved within a period of 3 years (Hussain, Shahmoradi & Turk, 2015, p. 4).

Despite the above-mentioned circumstances, the decision of Sudan, Pakistan and Iran to fully convert their economies into ones based on the Islamic principles in 1980s left markets staggered. Such western financial market representatives as Citibank and HSBC reacted by including Islamic financial services into their daily operations in order to enable a continuous collaboration with countries rich with petrodollars. Since then the Islamic banking continued its expansion in engagement of such areas as real estate, wealth management, future and forward markets, hedging funds, liquidity management, Sukuk, Takaful, assets management, private equity, mutual funds and Islamic Stock Exchange. (Shahzad, Zia, Ahmed, Fareed & Zulfigar, 2014, p. 216).

Not only several Western financial institutions started offering Islamic financial services, but also the International Monetary Fund and the World Bank recognized the Islamic financial products as adequately functioning alternatives to conventional financial products. During 1990s the development of the Islamic financial institutions other than banks also took place. For instance, Islamic investment funds and insurance companies were established. Nevertheless, the Islamic banks still account for more than 80% of Islamic financial assets (Abedifar, Ebhrahim, Molyneux & Tarazi, 2015, p. 639).

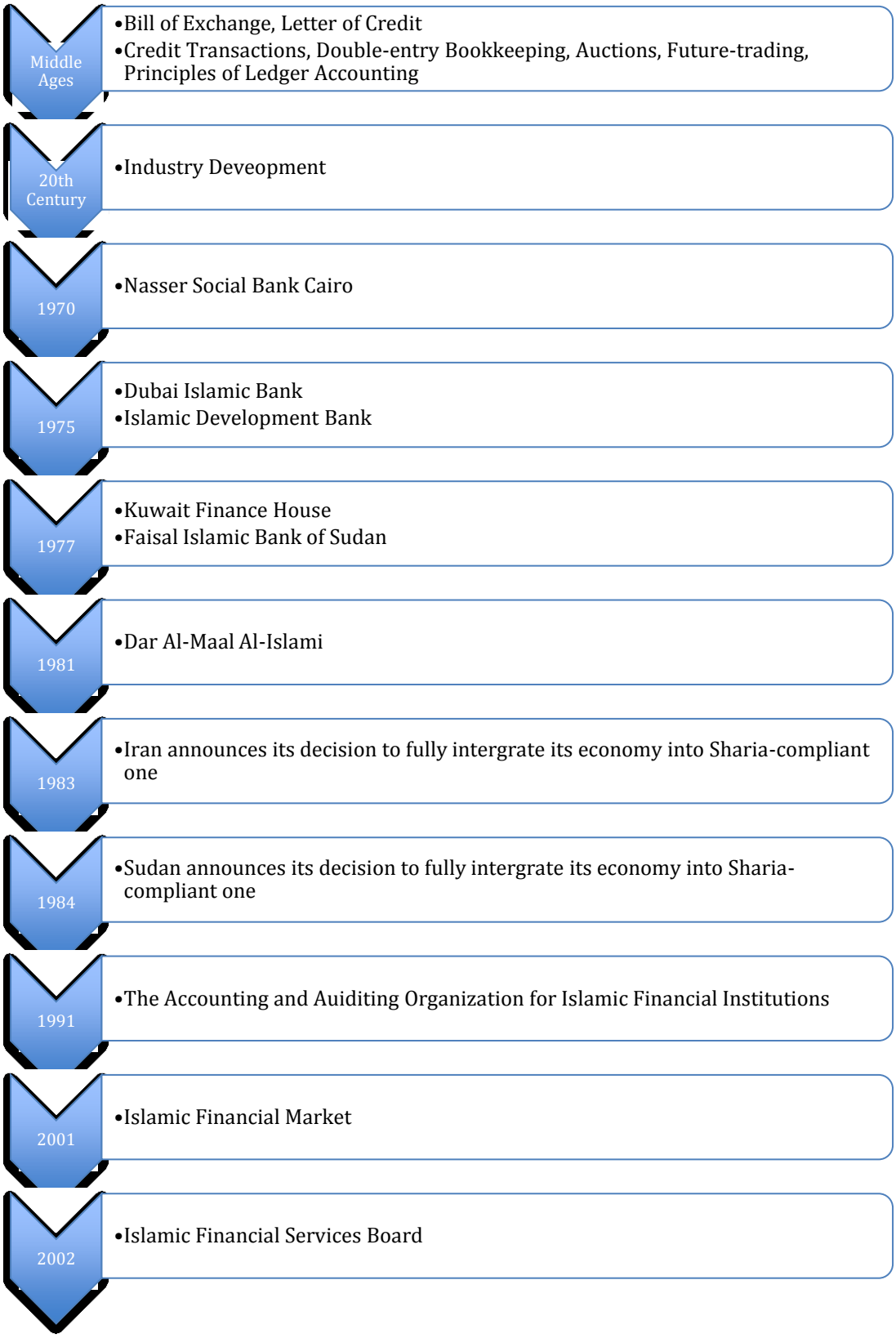
In 2001, Bahrain, Malaysia, Sudan, Indonesia and Saudi Arabia initiated the creation of the International Islamic Financial Market (IIFM). The main purpose of the IIFM is to facilitate the Islamic financial instruments trading in the secondary market. Moreover, IIFM established the Sharia Supervisory Committee composed of famous Islamic scholars and aimed at the harmonization of international implementation of Islamic instruments (Naveed, 2015a, International Islamic Financial Market (IIFM) section).

In 2002 the Islamic Financial Services Board (IFSB) was established in Malaysia. Its main mission is the establishment of Islamic financial regulatory guidelines and standards. It also works at communicating these guidelines and standards to relevant authorities (Hussain, Shahmoradi & Turk, 2015, pp. 4-5). According to one of the evaluations, in 2014 Islamic finance industry's size was estimated between $1.88 to $2.11 trillion USD and it is expected to grow as much as $3.4 trillion by 2018 (Naveed, 2015b).

Overall, the number and influence of Islamic financial institutions is constantly growing thanks to the increasing interest in Islamic finance. Obviously, the presence of regulatory

institutions is a huge advantage as standardization of activities and mainly reporting procedures serves as a great benefit not only for investors but also for academic researchers.

2.1.2. Timeline of Islamic Banking



2.1.3. Principles of Islamic Banking

The central principle of Islam is the compliance with Sharia in every aspect of life. Thus, not only day-to-day human activities, but also economic, political, business and social operations have to be in line with Sharia principles (Alwosabi, n.d., p. 1).

The first main principle of Islamic finance based on Sharia is the principle of equity. According to it, all of the transactions aimed at the increase of equity that somehow involve interest (*Riba*) are strictly prohibited in Islam. Muslims should only be involved in productive activities in order to increase their equity. Excessive uncertainty (*Gharar*) is prohibited as well. Thus, contract vagueness is not possible in the Islamic world. All of the contractual parties are obliged to fully disclose known information to one another. Thus, *Gharar* results in reduced information asymmetry. The principle of equity is involves Zakat that requires all Muslims above the certain income level to annually share 2.5% of their income with the poor (Hussain, Shahmoradi & Turk, 2015, p 6). Obviously, the fact that interest is prohibited does not mean that profits are not allowed.

Principle of participation, the second principle of Islamic finance, states that profits should be earned in line with risk-taking and should not be fixed in accordance with time passed. Hence, *Riba* is also prohibited in accordance with the second principle as well. The returns from the assets dependent on the amount of risk taken and productive activities related to the assets constitute the main idea of the second principle of Islamic finance (Hussain, Shahmoradi & Turk, 2015, p. 6).

The third and last principle of Islamic finance is the principle of ownership. According to Sharia, Muslims cannot sell anything that is not in their direct possession. Moreover,

Muslims cannot be deprived of their assets unless it is done on the basis of someone else's rights. Thus, Islamic finance should be purely asset-based and respectful towards property rights (Hussain, Shahmoradi & Turk, 2015, p. 6).

2.1.4. Products of Islamic Banking

There are two Islamic banking products based on Profit-and-Loss Sharing (PLS) principle: *mudaraba and musharaka.* PLS basis guarantees justice due to the fact that profits result directly from the business project's results. The core determinants of PLS principles are participation and equity. Share in profit is pre-determined by mutual-consent of parties involved. Losses are shared by the capital provider and the entrepreneur in accordance with their share in the initial capital invested. This method of financing might be more efficient in terms of resources allocation than traditional loans (Turk, 2014, p.6).

Mudaraba, an equity-based contract, is an Islamic banking product called "partnership". The main objective of this partnership is to align a manager (*Mudarib)* with a capital provider (*Rabb al maal). Rabb al maal* provides money to *Mudarib* for financial support of any business activity. If a project starts to generate revenue the profit will be divided among parties in accordance with the pre-determined ratio. In case of loss only the capital provider bears a monetary loss, while the manager bears only a psychological loss of his failed physical contributions. The capital invested by the capital provider does not necessarily have to be the whole capital employed; the manager can also invest his own capital as well. In most cases, a depositor is a fund provider, while an Islamic bank is a manager. There are two distinguished types of *Mudaraba* contracts: restricted *Mudaraba* and unrestricted *Mudaraba*. In restricted *Mudaraba, Rabb al maal* exactly specifies

restrictions applicable to the type of any potential investment. On the other hand, unrestricted *Mudaraba* allows *Mudarib* to invest the provided capital in projects he considers reasonable. Investments in extra-ordinary projects should be made only after the consent of *Rabb al maal* is received (Waseem, 2014a) Hence, in *Mudaraba* contracts the interest present in conventional banking is substituted by profit sharing.

Musharaka is another contract based on partnership in Islamic banking. Several partners (*Mushariks*) provide capital for a project and all of them are qualified for a share of generated profit in accordance with mutually agreed ratio. Each *Musharik* has a right to contribute to the management decisions; however they can also decide not to be involved in managerial decisions and then can account only for the proportion of return not exceeding the initial proportion of their investment (Waseem, 2014b).

In reality non-PLS instruments of Islamic banking are used more frequently that PLS ones. These products are usually used for manufacturing, rental of assets, consumer and corporate credit financing. Non-PLS transactions are normally secured by the asset that they transaction is used for. *Murabaha, Ijarah, Istisna and Salam* are different types of non-PLS Islamic banking contracts (Hussain, Shahmoradi & Turk, 2015, p. 8).

Murabaha is the most popular equivalent of credit in Islamic banking. According to the *Murabaha* contract, a bank buys an item requested by a customer and sells it to him with an applied margin. The customer gets his goods instantly but pays at some point in future as agreed in the *Murabaha* contract. The amount can be either paid as a lump sum or periodical installments. *Murabaha* is not only used for purchase of consumer durables and person assets, but also fixed assets. *Murabaha* is similar to conventional loans with

major difference in the substitution of interest with a markup. Thus, from a prospective of Sharia, *Murabaha* is a sale procedure rather than a loan procedure. While under *Murabaha* contract, a seller is obliged to disclose the cost of the item and the applied margin, *Musawama* contracts have all of the same terms except for that item costs and markup should not necessarily be disclosed (Turk, 2014, pp. 31-41).

Ijarah is a contract that sells an entitlement to exploit an asset for some period of time. The individual leasing the asset can either purchase it or return it to the owner by the termination of the contact (Hussain, Shahmoradi & Turk, 2015, pp. 8-9). Hence, *Ijarah* contracts are similar to *Murabaha* contracts. In *Ijarah* contracts the bank holds an asset during the whole lease period, while in *Murabaha* the asset is held by the owner.

The general Sharia principle states that one cannot sell an item before it becomes available. However, there are two exceptions to this rule in the Islamic banking: *Salam and Istisna* contracts. *Salam* is a deferred contract that allows a prompt payment for goods delivered in the future. This type of transaction was allowed by the Prophet only to help small farmers that cannot produce a return right away but need several periods to pass in order to collect it. The quantity and quality of deferred goods produced by the party should be exactly specified and be liquid in the market. This kind of contract is usually used in agricultural sphere when a bank operates with farmers expecting plenty of commodities during harvest period (Turk, 2014, pp. 61-69).

In *Istisna* contracts a commodity is transacted before it is manufactured as well. The uniqueness of this contract is the fact that nothing is exchanged at the point when the contract is signed. It is the only future contract in the Islamic banking. An *Istisna*

transaction usually contains two contracts. Under the first contract the bank allows its customer to pay on a longer payment schedule basis; whereas according to the second contract the bank acts as a buyer and makes installment payments during a shorter time period. Upon completion of its payments, the bank re-sells the asset to the initial customer in accordance with the previously agreed longer schedule (Turk, 2014, pp. 72-76).

As deposits serve significant role in conventional banking industry, they are also important in Islamic banking and they are obviously required for the financing of Islamic bank products stated above. Non-remunerated deposits such as *Amanah* or *Qard* are identical to demand deposits offered by conventional banks. Saving and investment accounts such as *Mudaraba* do not provide any interest rates but allows investors to participate in bank profits (Beck, Demirgüç-Kunt, & Merrouche, 2013, p. 435).

Islamic banks also provide fee-based services, including issuance of letter of credits, bank transfers, letters of guarantees, issuance of credit cards, safe custody and collection services (Hussain, Shahmoradi & Turk, 2015, p. 10). In order to mitigate return and total deposits fluctuation Islamic banks are using Profit Equalization Reserves (PERs). The main purpose of PERs is competitiveness and stability guarantee. In the times when returns are low, Islamic banks can use PER in order to improve investors' returns (Can, 2012).

To conclude, five principles constitute the main difference between Sharia-compliant and conventional banking products. On one side, in Islamic banking there is a prohibition of interest, prohibition of risk and uncertainty, prohibition of investments or any other

relation to Sharia non-compliant sectors. On the other side, the principle of profit-and-loss sharing and the necessity of an asset to support any transaction are also crucial in the Islamic banking unlike the conventional one (Beck, Demirgüç-Kunt, & Merrouche, 2013, pp. 434-435).

2.1.5. Sharia-compliant Bank's Balance Sheet

According to all of the information provided above, a typical Islamic bank's balance sheet can be constructed.

Table 2.1: Islamic Bank's Balance Sheet

Assets	Liabilities
Inventory	Demand deposits
Profit-sharing transactions	Unrestricted equity-based contracts
Non-profit-sharing transactions (asset-backed)	Restricted equity-based contracts
Fee-based transactions	Profit Equalization Reserves (PERs)
Cash and equivalents	Shareholder's equity

Source: Greuning & Iqbal (2009)

As can be concluded from the table above, Islamic banks are in general similar to the conventional banks. The main difference is not in what the banks are doing, but in how they are doing it.

2.1.6. International Market Share of Islamic Banking

Islamic banking activities are mainly concentrated in Southeast Asia, South Asia and Middle East regions. Such Southeast Asian countries as Singapore, Indonesia and Malaysia are significantly developing presence of Islamic banking in order to attract Muslim financial and entrepreneurial resources. Such South Asian countries as Pakistan, Bangladesh, Afghanistan and India are rather new players in the Islamic banking

industry but they aim at rapid development of the industry within their territories as well. The implementation of the Islamic banking is also expected to disseminate in the US and Europe in the nearest future (Shahzad, Zia, Ahmed, Fareed & Zulfigar, 2014, p. 217).

The Middle East region is recognized as a headquarter region of the Islamic banking because vast majority of the Islamic banking regulatory authorities are concentrated in this area. The biggest support in this region comes not only from governments and particular state institutions, but also from wealthy individuals (Shahzad, Zia, Ahmed, Fareed & Zulfigar, 2014, p. 217).

Currently there are only two countries operating solely through Islamic institutions in the banking sector: Iran and Sudan (Abedifar, Ebhrahim, Molyneux & Tarazi, 2015, p. 638).

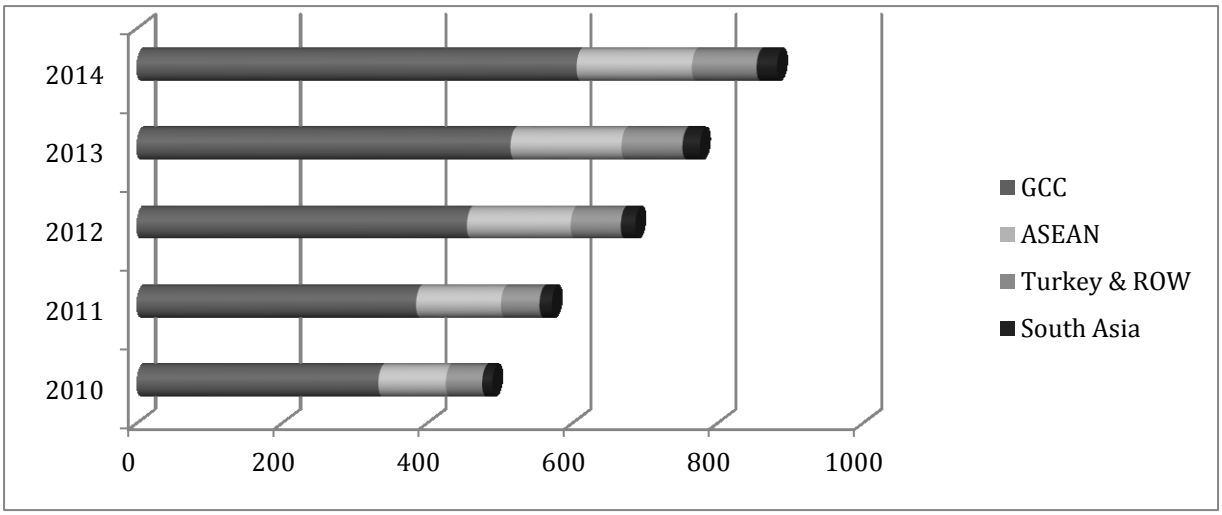


Figure 2.1: International Participation in banking assets

Source: EY World Islamic Banking Competitiveness Report (2016)

As demonstrated on the graph provided by the EY World Islamic Banking Competitiveness Report (2016), there is a confident growth of Islamic banking assets in the world. The number has been annually increasing for 16% from 2010 to 2014. The

total growth for the analyzed period equals to 80% despite political and economic obstacles in the regions. Moreover, the growth is present in all of the geographical locations examined. Numbers speak for themselves, as the growth is impressive indeed.

The same report (2016) provides a graph describing a contribution of each region to the worldwide growth. According to the report, the contribution of the GCC region is the most significant and constitutes 69% of overall growth in 2014. It is also reported that almost 93% of Islamic banking assets were in one of the nine core markets, including: Saudi Arabia, Malaysia, UAE, Kuwait, Qatar, Turkey, Indonesia, Bahrain and Pakistan.

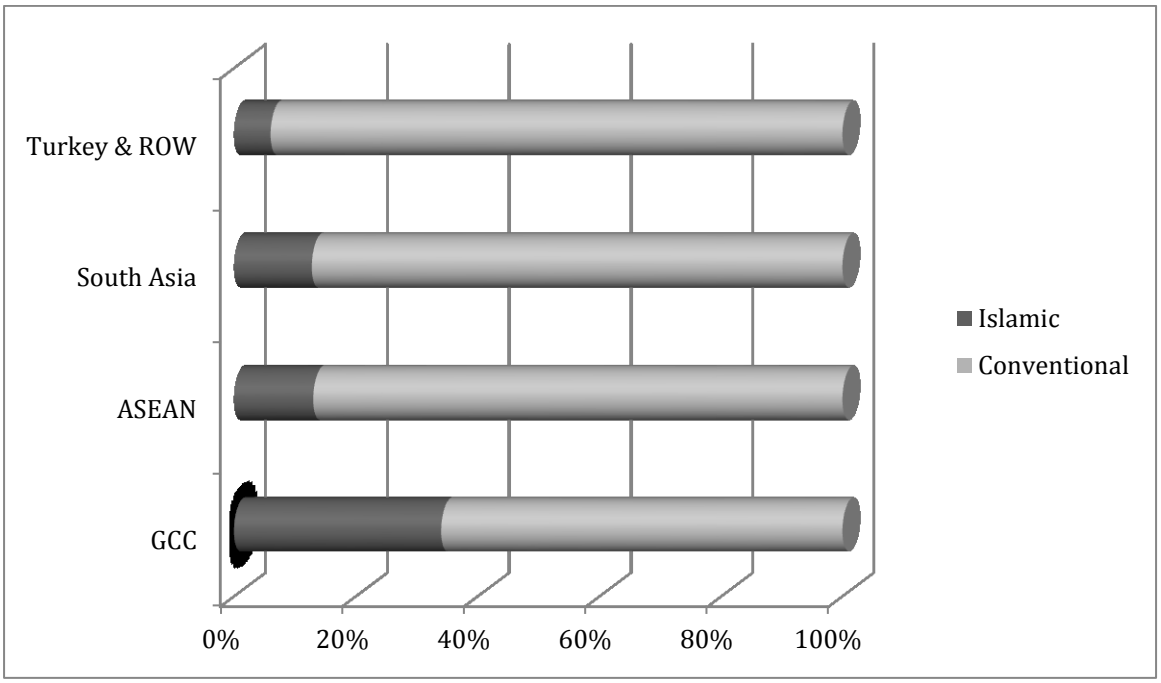


Figure 2.2: Share of Participation in banking assets

Source: EY World Islamic Banking Competitiveness Report 2016.

EY (2016) also provides a graph demonstrating that GCC (Arab States of the Persian Gulf except for Iraq) countries had the largest share of Islamic banking assets constituting 34%, followed by ASEAN (Association of Southeast Asian Countries)

states, followed by South Asia and Turkey & rest of the world accounting for the smallest share of only 6% in 2014. Information provided in this graph is extremely interesting as it demonstrates what a small portion of Islamic banking in terms of market potential has yet been realized. Thus, there are plenty of opportunities in expanding market share for Islamic banks.

According to the World Islamic Banking Competitiveness Report (2016), in all of the key markets, except for Turkey, the growth of Islamic banks is much higher in comparison with the conventional banks growth. Moreover, in 2020 the growth is projected to stay in place and the key players in terms of market share are assumed to be Saudi Arabia, Kuwait, Bahrain and Qatar.

2.1.7. Azerbaijani Economic Situation and Banking System

Even in 2016 Central Asia and Europe continue recovering from the financial crisis of 2008 while the region's Eastern part was heavily affected by significant reduction of oil prices. Azerbaijan, a small oil-producing country in the South Caucasus, faced a negative influence of the oil prices drop on its economy. High historical economic growth of the country remarkably decreased after the second half of 2015 to 1.1% compared with higher 2.8% in 2014. This decrease was the result of Azerbaijan's high economic dependence on oil. In the first half of 2015, non-oil performing sectors in Azerbaijan were demonstrating strong performance thanks to the investments injected by the government. However, in the second half of 2015 as government cut its investments the non-oil sector, performance notably decreased. For instance, only the construction sector, the main non-oil driver of the economy, decreased by 13% during that period ("The Impact of China on Europe and Central Asia", 2016, pp. 77-79).

As the result, in February 2015 Azerbaijani Central Bank devalued the manat, national currency, by 33.5%. In December of the same year, Azerbaijani Central Bank again devaluated the currency by another 47%. Since then the currency has continued loosing its value. In particularly, before the first devaluation 1 AZN = 0.78 USD, on 12th December of 2016 1 AZN = 1.743 USD (Fuller, 2016).

The international reserves of the country fell from 14 billion USD to 5 billion USD in 2015. That year the current account's ended with a surplus of 0.8 in comparison to a surplus of 13.8% in 2014. Despite the strongly devalued currency the trade balance together with non-oil exports demonstrated a downtrend. The year-on-year inflation increased to 7.7% in 2015, while in 2014 it was 1.1%. All these could not leave banking sector unaffected and as the result banks' vulnerability has been increasing. The banks' portfolio of assets has been worsening with an increasing number of non-performing loans as vast majority of them were in foreign currency. Eight banks lost their licenses and hence stopped their operations. The government also injected high amounts of capital into International Bank of Azerbaijan that owned 37% of country's banking assets in 2014. The fragility of financial sector is expected to increase even more in the upcoming years. More banks are expected to lose their licenses due to the strong increase of dollarization and growing number of non-performing loans ("The Impact of China on Europe and Central Asia", 2016, pp. 77-79).

93% of 9 million of total Azerbaijani population is estimated to be Muslim. Thus, this is a represents positive market signal for Sharia-compliant banks. Azerbaijani authorities might facilitate an interest-free legislation in 2017 allowing the first Islamic bank in

Azerbaijan to launch its operations. Considering the current negative situation of banking sector in the country, the emergence of as assumed more stable and profitable Islamic banks in the country might have a positive impact on the sector's situation. Thus, upon testing the hypothesis of this research the usefulness of the potential applicability of Islamic banking services in Azerbaijan would be estimated (Saleem, 2016).

2.2. Literature review

The topic of Islamic banking efficiency and stability relative to conventional banks is widely studied from different perspectives. The first wave of papers uses data on particular counties and few number of banks. Bashir (1999) using OLS regression for two Islamic banks from Sudan for the period 1979-1993 showed that large banks tend to be more profitable, but less stable in terms of equity to assets ratio. The evidence from Malaysia is ambiguous: Samad (1999) using descriptive statistics and ANOVA showed higher cost efficiency of Islamic banks, while Majid et al (2003) reports no significant difference in cost efficiency between Islamic and conventional banks, when using stochastic frontier analysis as an analytic tool. Hanif et al (2012) claim that conventional banks in Pakistan have higher liquidity and profitability, while Islamic banks are better in terms of risk management and solvency.

The second wave of research considers groups of countries and more advanced statistical and econometric techniques. Hassan and Bashir (2005) employ GLS regression on the data from 21 countries and estimated higher profitability of Islamic banks conditional on higher equity to assets and loans to assets ratios. Similar findings are reported in Iqbal (2001), Al-Jarrah and Molyneux (2005), Olson and Zoubi (2008), Rashwan (2010),

Khediri et al (2015). On the other hand, some papers (Mohamad et al, 2008; Bader et al, 2008) report no significant difference in profitability and stability between Islamic and conventional banks. Finally, Johnes et al (2009) find significantly lower efficiency of Islamic banks for 6 GCC countries.

In the relatively recent research, Beck et al (2013) use a sample of 141 countries for the period 1995-2007 and report few significant differences between Islamic and conventional banks in terms of profitability and stability.

To reach their goals authors use different techniques, including t-test for equality of means (Iqbal, 2001; Olson and Zoubi, 2008; Srairi, 2010), OLS regressions (Bashir, 1999; Yudisra, 2004; Beck et al, 2013), GLS regression (Hassan and Bashir, 2005), stochastic frontier analysis (Majid et al, 2003; Al-Jarrah and Molyneux, 2005; Mohammad et al, 2008) and statistical analysis: ANOVA (Samad, 1999), Wilcoxon rank-sum test (Belanes and Hassiki, 2012) and others.

In addition, these works use different time periods, which coupled with different samples and techniques may produce sometimes opposite results. Due to this ambiguity, we want to employ in this research the most recent data on Islamic and conventional banks from Asian and European countries. Also our hypothesis on higher profitability of Islamic banks is supported by GMM analysis which, to the best of our knowledge, have not been used before in other studies.

In recent years, the research in the field changed its accent to the link between Islamic banking and socio-economic situation in countries. Boukhatem and Moussa (2017) in their research address the question of whether there is a relationship between Islamic

banking and economic growth. They estimate positive effect of Islamic banking loans on economic growth of 13 Middle East and Northern Africa countries during 2000-2014 period. Their findings go in line with the previous research of Gheeraert and Weill (2015), who use a sample of 70 countries for the period 2000-2005 and identify a positive impact of Islamic banking on macroeconomic efficiency. Although the last paper states that there is a certain point after which the expansion of Islamic banking becomes detrimental to the economic efficiency.

On the other hand, Aysan and Ozturk (2018) state that Islamic banks in Turkey exhibit procyclical lending patterns as conventional banks do. This refutes previous studies that Islamic banks serve as natural stabilizers and prevent economies from deep recessions (e.g., Chapra, 2007).

There is also research in another direction of causality: how economy and society affects the development of Islamic banking in the country? Uddin et al (2017) provide the evidence from Bangladesh that socio-economic factors, such as corruption, property rights and political stability have negative impact on Islamic banking in terms of profitability and stability. Moreover, GDP growth also negatively affects Islamic banks' performance.

The gender participation is viewed by some authors as one of the socio-economic factors which possibly has correlation with Islamic banking development. This direction of research is not much developed. Pasha (2010) provides the data on growing share of women-owned businesses in the Muslim countries, suggesting that women are becoming to play bigger role in Islamic finance. The same evidence is provided by Islamic Finance

News (2015), where the authors suggest that women have a good potential for Islamic banks market expansion. Nevertheless, there is lack of academic research in this field. We can suggest Haider et al (2017), who document the different gender effects while adopting mobile Islamic banking applications in Pakistan. The authors report that men and women seek different features in the mobile applications. The former look for usefulness and self-expressiveness, while the latter react to higher credibility of the bank.

Otherwise this field of research seems unexplored and gives an opportunity to fill the gap with our third hypothesis which aims to explore the relationship between Islamic banking penetration and women participation in the financial system.

3. Empirical Research

3.1. Methodology and Data

The empirical research to be run in this chapter of the thesis is set to reveal the differences between general commercial and Islamic banking institutions across a set of preliminarily chosen criteria. We base our selection of variables on the works of other authors, including Cihak and Hesse (2016), Hassan&Bashir (2005), Khediri et al. (2015), Srairi (2010), Weill (2017) and others. When analyzing summary statistics for each variable we explicitly cite the authors who obtained similar or different to our results.

For the purposes of this research, we divide variables into three groups: outcome variables (or variables of interest), bank-specific control variables and country-specific control variables.

1. The outcome variables include two measures of profitability: return on assets and return on equity and one measure of stability: Z-score. Return on assets is calculated as a ratio of net profit to total assets: $ROA = \frac{Net\ profit}{Total\ assets}$ and return on equity is calculated as a ratio of net profit to equity: $ROE = \frac{Net\ profit}{Shareholders' equity}$. In line with the recommendations of the World bank, Z-Score is calculated as $Z = \frac{ROA + \frac{Equity}{Total\ assets}}{St.d.(ROA)}$, where ROA stands for return on assets, and St.d.(ROA) stands for standard deviation of ROA.

2. The group of bank-specific control variables includes fee-to-income ratio, loans-to-assets ratio, deposits-to-assets ratio, equity-to-assets ratio, cost-to-income ratio and

natural logarithm of assets. Together with these variables we use two dummy variables: Islamic, taking 1 if the bank is Islamic and 0 otherwise. This is the main variable of interest, because our hypotheses explicitly state that Islamic banks are different in terms of profitability and stability. Another dummy variable is "Advanced" taking 1 if the bank operates in advanced economy and 0 otherwise. We use the approach of World Bank to decide whether the economy is advanced or not. The description of these variables together with their calculation method are given in the table 3.1.

Table 3.1: Description of bank-specific control variables

Variable	Description
Islamic	Dummy variable. Takes value 1 if the bank is Islamic and 0 otherwise
Advanced	Dummy variable. Takes value 1 if the bank operates in the advanced economy and 0 otherwise
FtI	Fee to income ratio. The ratio of fee to the operating income of a bank
LTA	Loans to assets. The ratio of net loans to the total value of assets
DTA	Deposits to assets. The ratio of total deposits to the total value of assets
EtTA	Equity to total assets. The ratio of bank equity to the total value of assets
CtIR	Cost to income ratio. The ratio of bank cost to the value of net income
LogAssets	The natural logarithm of bank assets

Source: author's computations

3. Country-specific control variables include real GDP growth *(rGDPgrowth*), consumer price index (*CPI*), average lending interest rate (*IntRate*) and average deposit rate (*DepRate*).

The data on outcome and bank-specific variables for the empirical research are obtained from Bankscope, a large-scale database containing detailed financial information pertaining to the activities of banking institutions worldwide. The data presented in

Bankscope are grouped in a convenient way, and allow effectively tracking financial information separately for commercial and Islamic banks, which fits well the purposes of this research.

The data on country-specific variables are obtained from the World Bank database and a cover the period of 2010-2016 and includes 2,374 banking institutions from Asia, Western and Eastern Europe, including 2,244 conventional banking institutions and 130 Islamic banks.

The regions of Europe and Asia were chosen for the purpose of being able to compare the differences in the development of Islamic banking in Asia (the continent with the highest share of Muslim population, and thus with the best opportunities for the development of Islamic banking) and in Europe where Islamic banking has been gaining popularity in recent years. In total, the statistical sample outlined above included 22 Asian countries, 14 Western European states, and 10 Eastern European states.

We start our empirical analysis with the summary statistics for all bank-specific variables, providing references on findings of other scholars who reported similar or different findings. We report mean values, standard deviation, max and min for each variable separately for Islamic and conventional banks for each year within the analyzed period. We also report p-value for t-test on difference in means, which gives us a basis to the initial suggestions on the significance in differences between two types of banks.

To formally and robustly check the first hypothesis we apply we apply GMM-analysis, where we regress separately ROA and ROE on the “Islamic” dummy variable, controlling for bank-specific and country-specific variables. The second hypothesis is

verified through regression of Z-score on bank-specific and country-specific controls, applying pooled OLS. For the third hypothesis we use the regression of financial services gender participation measures on market shares of Islamic and conventional banks together with other macroeconomic and financial controls. Now, based on the methodology described above, we proceed directly to the investigation of the key findings of this empirical research.

3.2. Findings

In order to analyze the data pertaining to the differences between conventional and Islamic banks, we first investigate the overall structure of the banks in the sample and reveal differences in terms of the structure of banks in different countries and continents, with the main focus put on the share of Islamic banks.

Table 3.2: Share of Islamic banks in investigated countries

Country	Total	Conventional	Islamic	Share of Islamic banks, %
ASIA	590	468	122	**20,7**
Afghanistan	10	10		**0**
Azerbaijan	23	23		**0**
Bahrain	30	9	21	**70**
Indonesia	88	77	11	**12,5**
Iran, Islamic Rep.	23	2	21	**91,3**
Iraq	31	20	11	**35,5**
Israel	12	12		**0**
Jordan	17	12	5	**29,4**
Kuwait	16	6	10	**62,5**
Lebanon	40	38	2	**5**
Oman	10	7	3	**30**
Palestine	4	2	2	**50**
Philippines	64	63	1	**1,6**
Qatar	11	6	5	**45,5**
Saudi Arabia	16	10	6	**37,5**
Singapore	13	12	1	**7,7**

Syrian Arab Republic	15	12	3	**20**
Taiwan	43	43		**0**
Tajikistan	6	6		**0**
Thailand	26	25	1	**3,8**
Turkey	50	45	5	**10**
Turkmenistan	2	2		**0**
United Arab Emirates	32	22	10	**31,3**
Yemen, Rep.	8	4	4	**50**
WESTERN EUROPE	738	738	8	**1,1**
Austria	89	89		**0**
Belgium	26	26		**0**
Cyprus	33	32	1	**3**
Denmark	33	33		**0**
Finland	26	26		**0**
France	109	109		**0**
Italy	83	83		**0**
Netherlands	27	27		**0**
Norway	21	21		**0**
Portugal	21	21		**0**
Sweden	29	29		**0**
Switzerland	117	117		**0**
United Kingdom	124	117	7	**5,6**
EASTERN EUROPE	1046	1046	0	**0**
Albania	12	12		**0**
Czech Republic	20	20		**0**
Hungary	21	21		**0**
Macedonia, FYR	12	12		**0**
Romania	21	21		**0**
Russian Federation	751	751		**0**
Serbia	26	26		**0**
Slovak Republic	9	9		**0**
Slovenia	11	11		**0**
Ukraine	163	163		**0**
Total	2374	2244	130	**5,5**

Source: author's computations

Table 3.2 above shows the share of Islamic banks in all countries which are included in the statistical sample for the purposes of this analysis. The first thing that deserves to be mentioned is the fact that there are great differences in the share of Islamic banks between Europe and Asia.

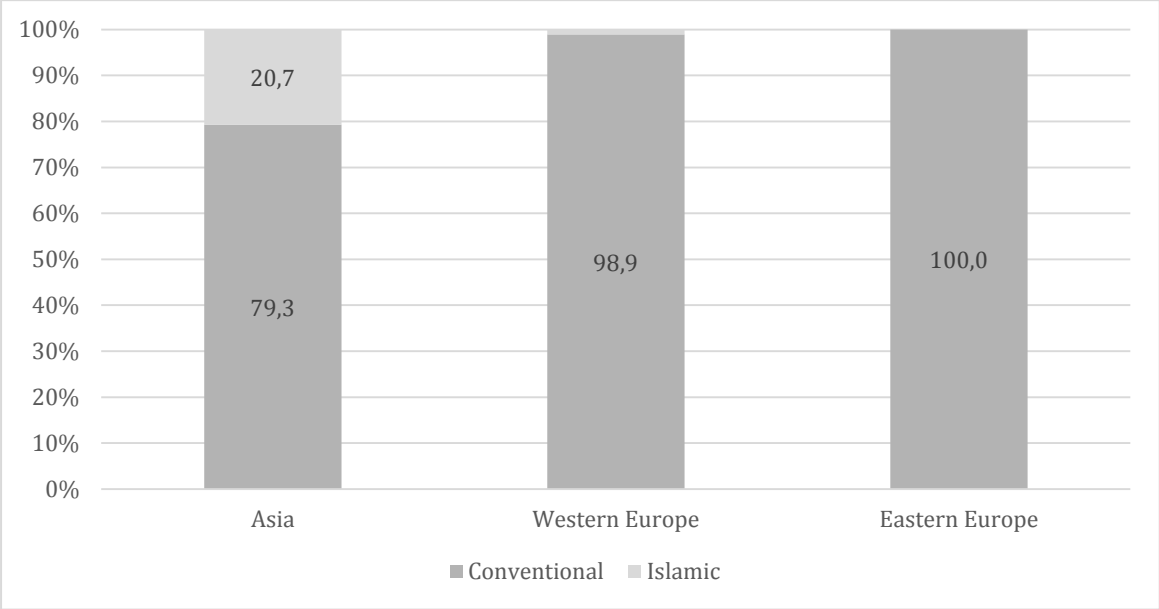


Figure 3.1: Structure of banks in investigated continents

Source: author's computations

As can be seen from Figure 3.1 above, the total share of Islamic banks in Asia in our sample (590 banking institutions) amounts to 20.7%. At the same time, in Western Europe this figure is only 1.1% for a sample of 738 banks, and in Eastern Europe, it amounts to 0% for a sample of 1,046 banks, which means that there are no Islamic banks in Eastern Europe in the analyzed sample at all.

Furthermore, if we take a closer look at the sample of Western European banks, we will see that only 2 of 13 Western European states have Islamic banks at all: the United Kingdom, and Cyprus. Given the fact that Cyprus has a considerable part of Muslim population, such a division is of no surprise, and only the United Kingdom stands out of the rest of Western European states.

Therefore, based on this, we can confirm that the development of Islamic banking in Europe is significantly lower compared to Asian states.

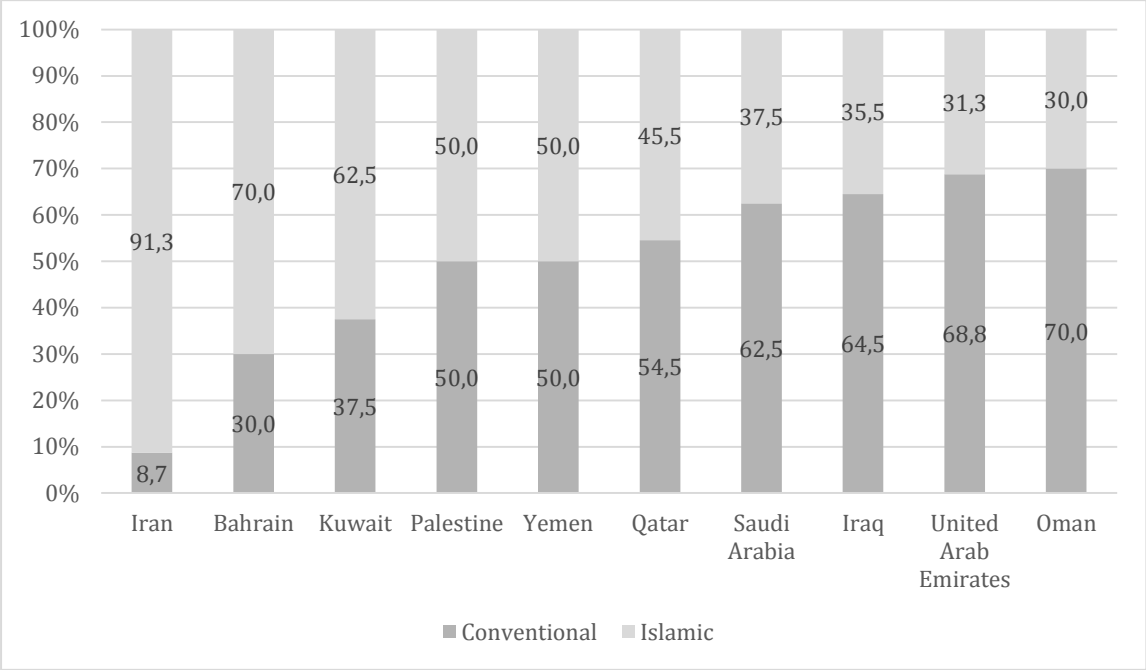


Figure 3.2: Top 10 countries in terms of the share of Islamic banks in total number of banking institutions

Source: author's computations

As can be seen from Figure 3.2 above, all the top 10 countries in terms of the share of Islamic banks in the total number of banking institutions in the chosen sample are located in Asia. Furthermore, another aspect which should be noted in particular is the fact that there are great disparities in terms of the proportion of Islamic and conventional commercial banks in different Asian states. Thus, the greatest share of Islamic banks in the sample is in Iran: 91.3% against only 8.7% of conventional commercial banks. This can be explained by the domination of Sharia laws in Iran and the country's cultural traditions deeply rooted in the Islamic religion. In Bahrain and Kuwait, the shares of Islamic banks in the total structure of banks are greater than the shares of conventional banks: 70% and 62.5%, respectively. In Yemen and Palestine, those shares are equal. In the rest of the top 10 countries in the chosen sample, the share of Islamic banks is lower

compared to conventional banks, but still significantly over the top European countries in terms of the share of Islamic banks.

Therefore, the statistics illustrated above prove once again that the shares of Islamic banks are larger in those states whose traditions are rooted in Islam and whose governance is based on Sharia laws. In European states which are not Muslim, the shares of Islamic banks vary from 0% to small figures which are considerably lower compared to Asian states.

We proceed with the summary statistics for the dependent variables of our main regressions: ROE, ROE and Z-score. Table 3.3 shows mean, standard deviation, max and min ROA for conventional and Islamic banks for the period 2010-2016. The last column shows p-value of the two-sample t-test for difference in means. H_0 of this test states that mean ROA for conventional and Islamic banks are the same and H_1 states that the means are significantly different.

Table 3.3: Summary statistics for ROA of Conventional and Islamic banks

Year	mean		standard deviation		max		min		p-value
	Conv.	Islamic	Conv.	Islamic	Conv.	Islamic	Conv.	Islamic	
2010	**-1,98**	**2,25**	**4,32**	**1,23**	**0,2**	**4,41**	**-8,46**	**0,74**	**0,143**
2011	**0,46**	1,54	6,63	1,93	3,38	6,98	-86,03	-2,4	0,076
2012	**0,88**	1,53	1,56	1,67	7,26	5,44	-8,21	-4,37	0,034
2013	**0,62**	1,31	2,92	2,12	10,46	6,01	-44,38	-6,28	0,035
2014	**0,37**	1,05	5,06	2,19	33,89	6,08	-104,41	-7,3	0,036
2015	**0,21**	0,25	6,06	3,03	36,69	5,98	-92,52	-16,89	0,914
2016	**-1,21**	0,11	22,25	2,76	41,83	5,42	-593,76	-12,18	0,092

Source: author's computations

ROA is an indicator which allows measuring the effectiveness with which banks use their assets for the purpose of generating profits. Thus, ROA allows measuring the profitability of banks.

We can observe that over the period 2011-2016 mean ROA of Islamic banks is above mean ROA of Conventional banks and, at the same time, Islamic banks have smaller standard deviation of this variable. P-values of the two-sample t-test show that the means are significantly different only for the period 2012-2014. In the 2010, 2011 and 2016 the significance level is close to 10% and in only in the 2015 it is far from being significant.

The variation of sample is quite high depending on the range between maximum and minimum values of ROA. Still, Islamic banks show less variation, which lets to assume that Islamic banks are more stable in this variable.

Figure 3.3 shows the dynamics of mean ROA for Conventional banks (blue) and Islamic banks (red) together with 95% confidence intervals for means. We see that for 2012-2014 the confidence intervals almost don't cross while in other years they significantly overlap.

Our findings are confirmed by Beck et al. (2013, p. 438). They emphasize that in their sample, there is a significant difference observed in terms of the mean ROA values achieved by conventional commercial banks and Islamic banks. The researchers claim that this proves the higher profitability of Islamic banks, and illustrates how they are more reliable in terms of the risks throughout the course of their business activities.

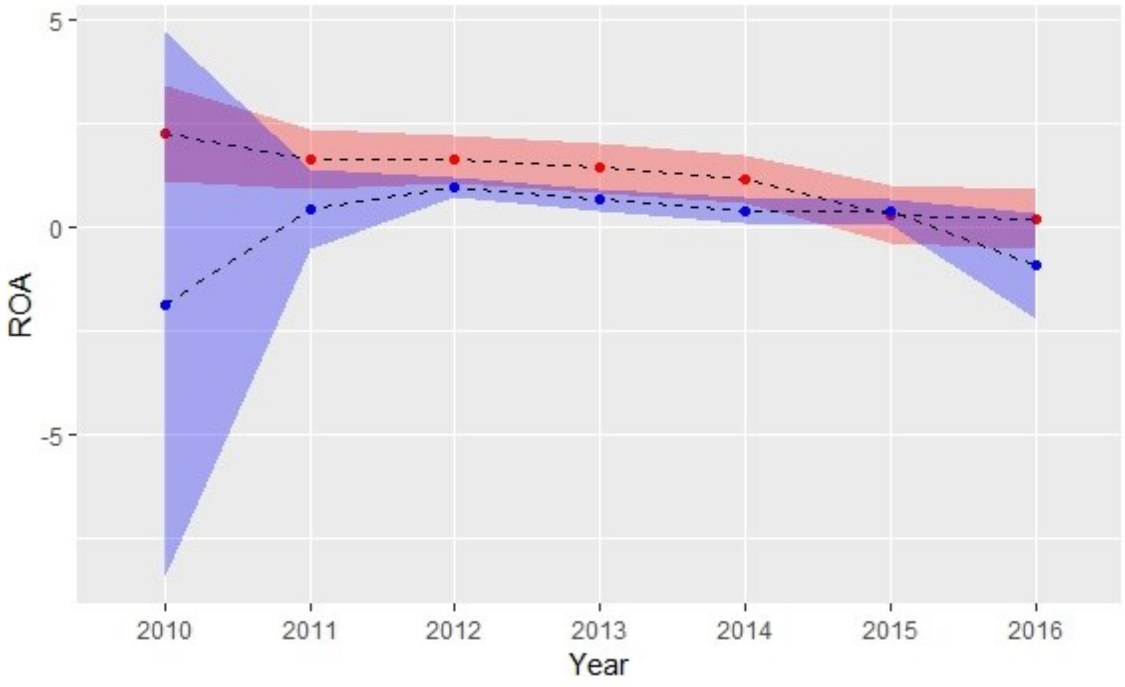


Figure 3.3: Mean ROA and 95% confidence intervals for Conventional (blue) and Islamic (red) banks

Source: author's computations

Now we move to the analysis of the second variable of interest: return on equity. Table 3.4 displays summary statistics for this variable separately for Conventional and Islamic banks.

ROE demonstrates similar features as ROA. First, we observe that Islamic banks on average outperform Conventional banks in terms of mean ROE for the whole time period. The same t-test for difference in means produces more significant results showing that for 2014-2016 the difference is significant of 95% level, while for other years it is significant on the level about 90%.

Table 3.4: Summary statistics for ROE of Conventional and Islamic banks

Year	mean		standard deviation		max		min		p-value
	Conv.	Islamic	Conv.	Islamic	Conv.	Islamic	Conv.	Islamic	
2010	**-13,55**	**25,78**	**28,82**	**9,43**	**1,72**	**39,99**	**-56,77**	**11,96**	**0,068**
2011	**6,09**	11,11	31,88	11,14	183,82	34,02	-252,32	-17,29	0,11
2012	**7,16**	11,16	11,55	13,8	61,98	32,54	-63,29	-52,17	0,103
2013	**6,86**	9,84	27,98	11,36	479,69	40,58	-146,16	-19,09	0,137
2014	**3,37**	10,77	35,74	25,82	693,13	197,65	-264,07	-12,44	0,036
2015	**-5,29**	5,53	122,8	19,82	245,28	116,32	-3530,5	-58,29	0,015
2016	**-5,58**	5,55	178,76	10,62	989,63	36,09	-3818,5	-27,65	0,048

Source: author's computations

In terms of ROE standard deviation Islamic banks are also more stable. Each year, except 2012, the volatility of Islamic banks' ROE is noticeably smaller than that of Conventional banks. The range of ROE (maximum minus minimum) is also significantly smaller for Islamic banks.

On the figure 3.4 we observe similar to ROA pattern of ROE dynamics of Conventional (blue) and Islamic (red) banks with 95% confidence intervals. As for ROA the confidence intervals slightly coincide for 2012-2015, while for other years they overlap on the wider segments.

This illustrates that the average return on equity of Islamic banks is higher. It is critically important to note here that this does not mean the overall higher profit margins in Islamic banks, as we speak of mean values here. On the contrary, this illustrates that the activities of conventional commercial banks are riskier, which has already been emphasized earlier in this thesis, and as a result of this volatility conventional banks may incur significant losses (hence having negative ROE values), which in the long run leads to the difference in average ROE values of conventional and Islamic banks as outlined

above. This fact allows us emphasizing once again the greater opportunities to ensure stable operation which Islamic banks have against conventional banking institutions.

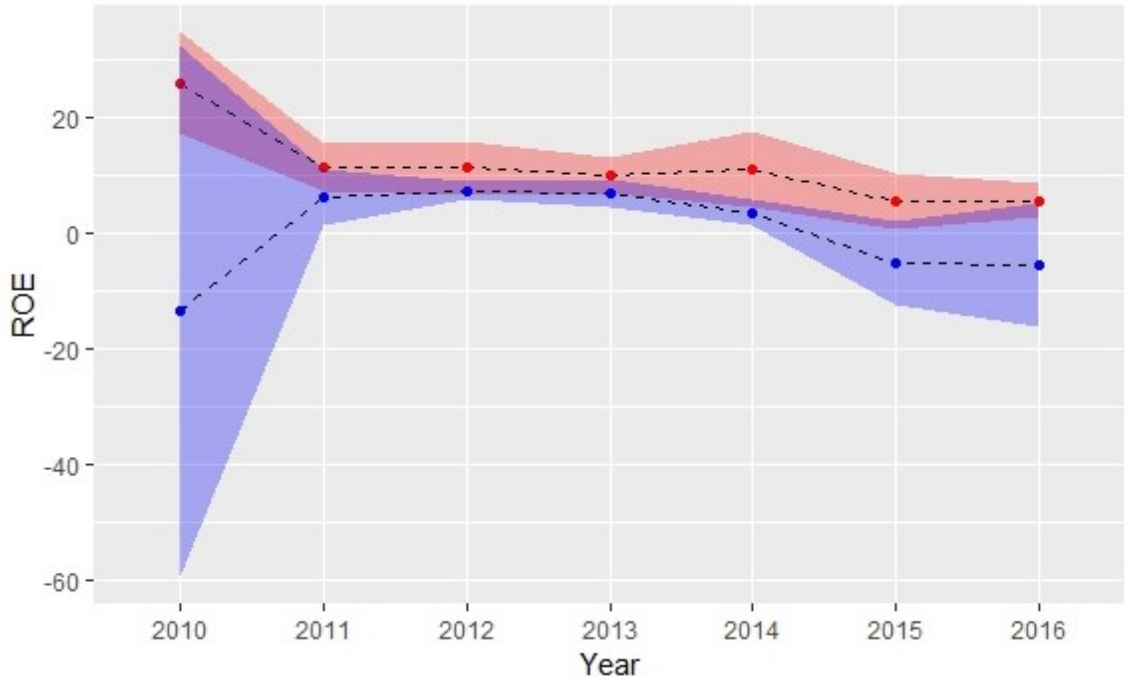


Figure 3.4: Mean ROE and 95% confidence intervals for Conventional (blue) and Islamic (red) banks

The initial findings of the comparison of ROA and ROE of Conventional and Islamic banks support our first hypothesis that Islamic banks demonstrate on average higher profitability. Later in this thesis we support this hypothesis with more concise and robust GMM estimation.

Now we turn attention to the summary statistics for Z-score, the measure of bank stability. Z-score can be the ultimate indicator of financial stability for the purposes of this research. As stated by the World Bank (n.d.), Z-score "*explicitly compares buffers (capitalization and returns) with risk (volatility of returns) to measure a bank's solvency risk… The popularity of the z-score stems from the fact that it has a clear (negative)*

relationship to the probability of a financial institution's insolvency, that is, the probability that the value of its assets becomes lower than the value of its debt. A higher z-score therefore implies a lower probability of insolvency."

Table 3.5 displays the summary statistics for Z-score. Recall that the larger Z-score is, the higher stability of the bank is. Thus, we see that on average conventional banks outperform by this measure Islamic banks. Moreover, t-test confirms statistically significant difference in means for 2013-2016, while for 2010-2012 p-values are high and the difference is insignificant.

The range of Z-score values for conventional banks is very large, while Islamic banks are more concentrated around mean. It may happen partially because of the big heterogeneity of our sample and because of presence of some outliers.

Table 3.5: Summary statistics for Z-score of Conventional and Islamic banks

Year	mean		standard deviation		max		min		p-value
	Conv.	Islamic	Conv.	Islamic	Conv.	Islamic	Conv.	Islamic	
2010	**31,67**	**19,67**	**60,32**	**28,45**	**312,69**	**104,53**	**0,75**	**1,61**	**0,252**
2011	**48,48**	65,69	70,71	100,47	1046,09	615,5	-1,43	0,91	0,381
2012	**92,94**	56,52	868,4	90,42	19021,2	603,41	-1,99	1,74	0,292
2013	**117,79**	52,48	653,13	77,65	17421,06	522,27	-16,42	0,08	0,004
2014	**110,46**	56,8	666,67	103,39	23186,2	864,22	-18,18	0,6	0,041
2015	**129,44**	59,48	761,78	128,39	20572,55	1049,03	-19,15	-2,91	0,041
2016	**131,97**	57,55	805,5	122,02	22567,3	1066,49	-8,37	-3,43	0,041

Source: author's computations

On figure 3.5 we can see the same pattern of Z-score for conventional and Islamic banks, when the former outperform the latter together with the higher range of Z-score values for conventional banks.

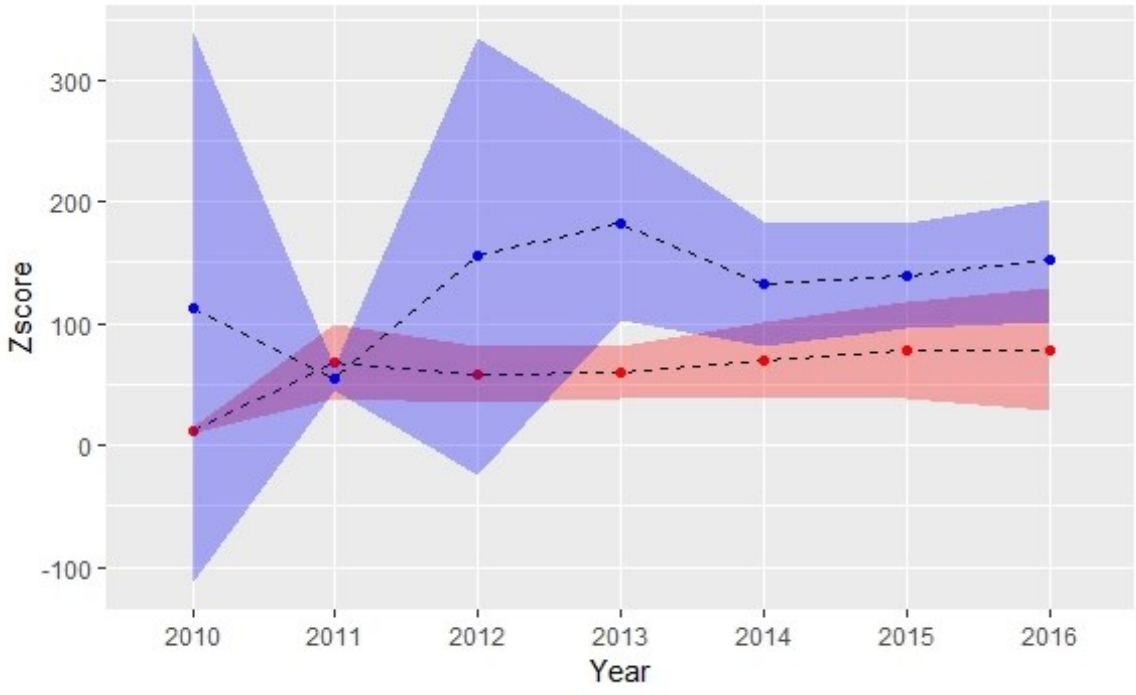


Figure 3.5: Z-score and 95% confidence intervals for Conventional (blue) and Islamic (red) banks

We should bear in mind that the concept of Z-score may have its drawbacks and flaws as applied to Islamic banks. Namely, as stated by Čihák and Hesse (2016, p. 8), "*A possible criticism of the z-score as applied to Islamic banks is that the risk-sharing arrangements provide an additional protective buffer in deposit liabilities, meaning that the book values of capital and reserves may underestimate financial strength of these banks... Even with unrestricted investment accounts, much of the risk is in principle borne by investors."* However, this argument can be denied by the fact that even conventional commercial banks have opportunities to pass their risks to customers, for example, though adjustments of the applicable deposit and loan rates.

These preliminary findings suggest that Islamic banks, in terms of Z-score, have lower stability than conventional banks.

In the next part of our analysis we describe independent variables used for our future regressions.

The first independent variable in our future regression is a ration of fee income to the total income of a bank. To the best of our knowledge, the existing literature on the Islamic and conventional banks comparison does not use this variable as a control. On the other hand, some works on banks performance in general use fee-to-income ratio as one of the controls (see, for example Kuc and Teply (2018) or Matt Isa et al. (2015, pp. 1546-1547)). Fee-to-income ratio for Islamic banks is consistently lower than that of conventional banks, so it might determine the difference in banks profitability as well. In the table 3.6 we can see the summary statistics for fee-to-income ratio

Table 3.6: Summary statistics for Fee-to-Income ratio of Conventional and Islamic banks

Year	mean		standard deviation		max		min		p-value
	Conv.	Islamic	Conv.	Islamic	Conv.	Islamic	Conv.	Islamic	
2010	**17,33**	**10,9**	**7,58**	**6,21**	**20,3**	**20,3**	**10,95**	**0,4**	**0,205**
2011	**21,09**	10,02	15,7	5,93	21,06	21,06	0,61	0	0
2012	**21,26**	14,36	14,68	11,03	51,31	51,31	0,48	0,34	0,0043
2013	**23,6**	13,8	20,8	15,62	77,79	77,79	0	0	0,0002
2014	**24,57**	14,39	21,38	14,48	68,89	68,89	0	0,12	0
2015	**24,12**	13,14	22,7	12,23	56,08	56,08	0	0,04	0
2016	**25,17**	10,04	31,64	8,09	49,62	49,62	0	0,01	0

Source: author's computations

We can see from the table that the ratio for Islamic banks is almost twice smaller than for conventional banks, also showing a smaller value of standard deviation. P-values for most of the years confirm that this difference is significant.

Our finding is confirmed by the work of Matt Isa et al. (2015) who state that the lower share of fee income in Islamic banking compared to conventional financial institutions should be considered as normal. In conventional banks, fee income is considered to be non-interest income, while in Islamic banks, it is considered to be non-financing income. Matt Isa et al. (2015) further note that "*Even though the contribution of fee income activities to the Islamic banking institutions income is still small, it has significantly increased from time to time.*" Therefore, from this paper we can find a confirmation derived throughout this research: indeed, Islamic banks tend to rely less on fee income compared to conventional banking institutions.

Justifying this fact, Matt Isa et al. (2015, p. 1547) emphasize that the business associated with fee income is inherently risky, and therefore Islamic banks which are more prone to conservative business-making tend to associate only a small share of their business portfolio with fee-income business. Furthermore, Matt Isa et al. (2015, p. 1547) claim that "*expanding into fee income activities may denote a rise in fixed costs, such as when additional staff may be required to manage the activity, the operational leverage of banks will increase.*" As Islamic banks generally have smaller resources compared to large conventional banks and given the above information regarding their use of a conservative approach to business-making, it can be stated that Islamic banks' average lower share of fee income in their business portfolio is destined to reduce the inherent volatility and to lower the overall level of Islamic banks' dependence on the conditions of the turbulent environment in the financial market.

A confirmation of the above findings can also be found in Molyneux and Yip (2013, p. 50) who state that "a shift towards fee based activities was associated with increased revenue volatility, earnings volatility and a higher degree of total leverage. Increased volatility is put down to a number of factors: lower switching costs for fee based income activities compared to lending activities; higher operating leverage (lower fixed costs) and financial leverage (lower capital requirements) of non-interest business areas." Thus, the researchers stress that the overall volatility in the case of fee-based activities is higher. For conventional banks, it is more convenient to raise the share of fee-generating business in their portfolio. However, for Islamic banks, the main goal is to ensure a high level of guaranteed stability, due to which they lower the share of fee business in their activities. Nevertheless, a smaller share of fee-income business in Islamic banks' portfolio is still of major importance to them in terms of the opportunity to diversify their business portfolio.

Therefore, overall, we can state that the mean figures of the share of fee income in total operational income revealed through the analysis of our statistical sample prove the previous assumptions made in the course of the research: indeed, Islamic banks rely significantly less on riskier activities compared to commercial banks on the average. The mean share of 9.8% held by fee-income business in Islamic banks' total portfolio proves that such activities are less important in terms of the share of income for Islamic banks compared to conventional financial institutions, but still do play an important role in terms of business diversification.

Next control variable in our research is the ratio of loans to total assets. This variable is used in many papers on the difference between Islamic and conventional banks, among them are Hassan and Bashir (2005), Khediri, Charfeddine and Youssef (2015), Weill (2017). Loans to assets ratio serves as a measure of risk. As claimed by Srairi (2010), banks with larger loans to assets ratio are expected to have larger profitability as they take more risks. This claim is supported by Hanif et al. (2012) who suggest that the higher this ratio, the stronger the bank is tied up in loans and, due to lower liquidity, it has higher risk of insolvency.

As we can see from the table 3.7, there is almost no difference between Islamic and conventional banks in terms of loans to assets ratio. Also p-value for the t-test shows no significant difference between two groups of banks. The variation of this measure is also not very different for two types of banks.

Table 3.7: Summary statistics for Loans-to-Assets ratio of Conventional and Islamic banks

Year	mean		standard deviation		max		min		p-value
	Conv.	Islamic	Conv.	Islamic	Conv.	Islamic	Conv.	Islamic	
2010	**61,09**	**63,06**	**2,7**	**9,02**	**63,63**	**75,6**	**57,39**	**51,43**	**0,61**
2011	**57,16**	57,33	14,89	16,99	90,06	80,64	9,67	8,03	0,71
2012	**58,32**	60,22	14,49	17,2	90,57	83,08	10,78	1,82	0,54
2013	**57,44**	55,69	20,16	20,87	96,18	106,43	0	8,35	0,57
2014	**54,34**	54,98	20,54	19,5	96,36	83,98	0	1,61	0,95
2015	**53,68**	57,34	21,18	18,65	99,4	86,4	0,02	11,46	0,24
2016	**51,56**	60,08	21,64	18,96	97,17	86,27	0	0,48	0

Source: author's computations

Our findings are consistent with the results of Cihak and Hesse (2016), Hassan and Bashir (2005) and Weill (2017), who use the sample of all countries with Islamic banks present, as well as Khediri et al. (2015) and Srairi (2010), who employ the sample of

GCC countries only. All these papers report nearly similar values (around 55%) of this ratio for conventional and Islamic banks. On contrast, Hanif et al (2012) report significantly larger value of loans to assets ratio of Pakistani banks. They also claim that conventional banks in Pakistan are more liquid and less risky than Islamic ones.

As a counterparty to the previous measure we use the next control variable: deposits to assets ratio. This ratio shows the dependence of the bank on the external funding. Khediri et al. (2015) and Weill (2017) use the same control variable, while Hassan&Bashir (2005) use loans to deposit ratio. We choose to use this version of the measure to prevent any possibilities of correlation between covariates.

Table 3.8: Summary statistics for Deposits-to-Assets ratio of Conventional and Islamic banks

Year	mean		standard deviation		max		min		p-value
	Conv.	Islamic	Conv.	Islamic	Conv.	Islamic	Conv.	Islamic	
2010	**53,1**	**78,84**	**23,7**	**7,66**	**83,6**	**87,52**	**27,9**	**65,43**	**0,12**
2011	**63,8**	68,08	17,4	23,1	89,2	90,78	0,4	8,97	0,6
2012	**64,3**	67,16	15,9	19,97	89,4	90,37	0,2	10,85	0,55
2013	**63,1**	63,37	19,8	23,65	95,4	90,32	0	0,14	0,97
2014	**62,9**	60,83	21,1	24,31	94,8	90,23	0	0,3	0,41
2015	**62,5**	59,98	21,6	24,63	113,6	101,5	0	0,18	0,21
2016	**63,4**	66,25	22,9	23,84	276	108,35	0	0,02	0,49

Source: author's computations

From the table 3.8 we can notice that the mean ratio of deposits to assets ratio for conventional banks is almost the same for the whole analyzed period, while for Islamic banks it decreases from 78.84% in 2010 to 59.98% in 2015. Although, p-values show no significant difference in means between two types of banks, the decline dynamic is apparent and consistent with findings of other authors, who report larger value of

deposits to assets for conventional banks than for Islamic banks (Khediri et al., 2015; Weill, 2013).

To wrap up the discussion on two previous variables we want to point out that Islamic banks do not operate with loans in a speculative manner as conventional commercial banks do. As a result, the opportunities of generating commercial profits from loans for Islamic banks are significantly narrower compared to conventional financial institutions. Rana et al. (2016, p. 319) also claim that "*loans to deposits ratio measures the degree of bank relies on borrowed funds. The high figure of LDR shows that bank is more relying on borrowed funds and leads to illiquidity.*" The authors run a statistical analysis of a sample of 8 banking institutions (4 conventional and 4 Islamic), and derive the finding that the loans to deposits ratio in Islamic banks is significantly smaller compared to conventional banks (over 22 p.p. of difference).

The general conclusion here is the same: LDR in Islamic banks is significantly smaller. Rana et al. (2016, p. 321) explain it by the fact that lower LDR ratio is what allows Islamic banks remaining more stable and lowering their volatility in the light of the changing market conditions. Therefore, this correlates with the previous findings of our research and highlights once again the inherent differences in the business approach and use of resources by conventional and Islamic banking institutions.

Similar findings are also derived through the analysis of Pakistani banking institutions by Aman et al. (2016). The authors argue that the lower LDR ratio in Islamic banks is common around the globe, and this is an indicator testifying that the overall approach to business activities adopted by Islamic financial institutions is rather more conservative

and more prone to focus on the avoidance of excessive risks and the minimization of possible losses. Therefore, this further confirms our previous findings described above.

Also, it is worth citing here Farooq and Zaheer (2015, p. 1) who claim: "We also find that Islamic bank branches grant more loans during financial panics and that their lending decisions are less sensitive to changes in deposits," which highlights once again the previous findings of our research and illustrates how Islamic banks may be using effectively the advantages in their business approach for the sake of ensuring effective financial performance.

Therefore, we can summarize here that similarly to the lower share of fee income in the aggregate operational income, Islamic banks' business model is characterized by a considerably lower ratio between loans and deposits, which illustrates the less risky approach to business activities which Islamic banks tend to adopt as opposed to conventional banks.

Equity to total assets ratio is called one of the most important ratios for banks (Iqbal, 2001). This ratio is used by regulators to measure the ability of bank to meet its obligations. Regulators set a minimum value of this ratio and banks must comply with this requirement. This ratio explicitly impacts the tradeoff between safety and profitability of the bank. From one prospective, large equity to assets ratio increases the possibility that the bank can satisfy all creditor claims. On the other hand, large equity means larger denominator in ROE and, thus, lower profitability for the bank owners. As Iqbal (2001) writes, "*given the return on assets, the smaller the bank capital, the higher the rate of return to the owners of the bank*".

Hassan and Bashir (2005) point the other relationship. Banks with larger equity to assets ratio are better capitalized and have an easier access to cheaper and less risky sources of funding. Subsequently, their profitability increases.

In table 3.9 we show summary statistics for the equity to assets ratio. Although, in most years, Islamic banks have larger value of this ratio, p-value suggests no significant difference in means. This finding contradicts previous results of Khediri et al (2015) who reported significantly higher ratio for Islamic banks in the period 2003-2010 for GCC countries. We attribute this contradiction to the differences in sample and analyzed period. Iqbal (2001) and Srairi (2010) also report higher measure of equity to assets for Islamic banks compared to conventional ones.

Table 3.9: Summary statistics for Equity-to-Total Assets ratio of Conventional and Islamic banks

Year	Mean		standard deviation		max		Min		p-value
	Conv.	Islamic	Conv.	Islamic	Conv.	Islamic	Conv.	Islamic	
2010	**28,46**	**8,27**	**20,79**	**2,17**	**56,56**	**11,04**	**10,77**	**5,55**	**0,15**
2011	**14,98**	19,89	10,29	18,13	70,07	79,93	2,82	5,74	0,26
2012	**15,12**	17,39	8,93	14,71	67,91	73,8	3,56	1,72	0,42
2013	**15,91**	20,54	12,83	18,65	100	91,14	-19,37	3,81	0,14
2014	**18,16**	21,74	14,8	19,48	99,91	80,68	-91,32	1,14	0,11
2015	**19,58**	20,11	16,87	18,55	99,9	78,12	-30,62	-7,63	0,63
2016	**18,99**	16,32	24,92	18,55	99,73	78,55	-489,7	-14,29	0,27

Source: author's computations

The fact that Islamic banks have higher ratio of equity to assets, says that formers tend to have a greater share of own funds in the financing of their activities compared to conventional banking institutions. In fact, this proves that Islamic banks rely less on external funding sources, which allows them being ultimately more stable in the market.

The same findings can also be found in Beck et al. (2013, p. 438) who illustrate the existing difference in terms of the proportion between equity and assets when comparing Islamic and conventional banks within their sample. According to the authors, this is another major confirmation of the fact that Islamic banks prefer inherently less risky activities in their business, and are more conservative in terms of the business model applied.

Cost to income ratio measures bank efficiency. It is inherently related to the bank profitability, because the lower the cost, the higher the profit. Cost to income ratio is used as a control variable for profitability in many studies, including Hanif et al (2012), Hassan and Bashir (2005), Srairi (2010) and others.

Table 3.10: Summary statistics for Cost-to-Income ratio of Conventional and Islamic banks

Year	Mean		standard deviation		max		Min		p-value
	Conv.	Islamic	Conv.	Islamic	Conv.	Islamic	Conv.	Islamic	
2010	**62,06**	**50,2**	**31,46**	**25,49**	**93,91**	**86,77**	**30,33**	**22,26**	**0,55**
2011	**63,56**	67,33	40,28	34,1	415,05	189,96	15,74	18,22	0,99
2012	**62,35**	62,86	27,03	24,72	218,56	121,85	11,27	21,66	0,85
2013	**67,86**	72,07	51,71	51,04	948,67	342,57	13,49	19,78	0,71
2014	**70,32**	75,75	34,66	43,86	440,34	292,22	7,6	20,95	0,5
2015	**71,7**	94,22	47,79	94,29	960,43	723,8	1,01	14,67	0,15
2016	**73,99**	86,06	43,56	45,47	497,47	266,39	5,52	27,99	0,21

Source: author's computations

As can be seen from the table 3.10, the cost to income ratio does not show obvious differences between conventional commercial banks and Islamic banks. In addition, p-values for all years are far from indicating statistically significant difference in means. This is consistent with the results of Hassan and Bashir (2005), who report p-value of

0.31 for the period 1994-2001. Srairi reports higher cost to income ratio for Islamic banks, although he does not provide a formal t-test for the difference in means.

The findings that we obtain are very similar to the findings obtained by Beck et al. (2013, p. 438) based on the analysis of over 5,800 banking institutions. According to the researchers, the difference between the average cost to income ratio in conventional commercial banks and Islamic banks amounts to 6.6 p.p. The fact that Islamic banks have higher costs to income compared to conventional banking institutions might be explained by two key facts. Thus, first of all, Islamic banks generally tend to have lower profit margins compared to conventional financial institutions, as their business is less risky and isn't based on the provision of speculative services. At the same time, the costs borne by Islamic banks in association with the overall narrower limit of their commercial operations might often lead to the need for Islamic banks to incur greater expenditures. As a result, those factors contribute to the difference outlined above.

The last control variable analyzed in this part is the size of a bank measured by the natural logarithm of assets. Cihak and Hesse (2016) specifically concentrate on the difference between large and small banks stability estimating their regressions separately for two samples. We in this work do not separate the sample, but control for the bank size explicitly through the log assets variable.

Table 3.11 shows surprising results suggesting that Islamic banks on average are larger than conventional ones. This holds for all years except 2011-2012, where we see reverse relationship and no significance. These results match the findings of Cihak and Hesse (2016).

Table 3.11: Summary statistics for logarithm if assets of Conventional and Islamic banks

Year	Mean		standard deviation		max		Min		p-value
	Conv.	Islamic	Conv.	Islamic	Conv.	Islamic	Conv.	Islamic	
2010	**11,49**	**16,53**	**1,34**	**1,02**	**12,86**	**17,69**	**9,75**	**8,42**	**0,0012**
2011	**15,18**	14,99	2,14	1,84	21,13	17,81	9,83	4,04	0,612
2012	**15,01**	15,1	2,22	1,84	21,04	17,97	9,67	1,62	0,3613
2013	**14,3**	14,96	2	1,68	20,85	18,39	9,63	3,15	0,0055
2014	**13,12**	14,77	2,16	1,75	20,8	17,89	8,3	0,6	0
2015	**12,77**	14,72	2,3	1,87	20,67	17,81	7,17	-2,91	0
2016	**12,62**	15,06	2,4	2,02	20,64	17,89	6,63	-3,43	0

Source: author's computations

Larger banks, as claimed by Weill (2017), may have higher profitability but also may face lower stability, which fits two our hypotheses. To verify this claim we include the logarithm of assets into the set of control variables.

3.3. Analysis of Hypothesis 1

The Hypothesis 1 states: Islamic banks report higher profitability than other banks.

We base our hypothesis on findings of Hassan and Bashir (2005), Iqbal (2001), Al-Jarrah and Molyneux (2005), Olson and Zoubi (2008), Rashwan (2010), Khediri et al (2015). All these papers using different statistical and econometric methods on different time and country samples estimated higher profitability of Islamic banks. Still, there are some papers (e.g. Johnes et al ,2009) that report no significant difference in profitability of Islamic banks. We want to resolve this discussion using system GMM approach to estimation, which has some good features of being robust to endogeneity issues.

The summary statistics and two-sample t-tests showed that Islamic banks in some years might outperform conventional banks in terms of profitability. In this section, we apply

more robust estimation of the effect that the bank type has on the profitability using system GMM approach.

The baseline model to test the hypothesis 1 is:

$$Prof_{i,t} = \rho \cdot Prof_{i,t-1} + \beta \cdot Islamic_i + \gamma \cdot X_{i.t} + \delta_t + \varepsilon_{i,t}$$

As the outcome variable $Prof_{i,t}$ we use ROA or ROE of bank i in year t. The model assumes that the profitability of banks has persistence and, thus, as a regressor we use lagged profitability. The main variable of interest is $Islamic_i$, which equals 1 if bank i is Islamic and 0 otherwise. $X_{i.t}$ is a vector of covariates described in table 3.9. δ_t is a time fixed-effects and $\varepsilon_{i,t}$is an error term.

The model we employ to test the hypothesis 1 is the first-order autoregressive, thus, we have a problem of endogeneity and must choose an appropriate method for estimation. Following Arellano and Bover (1995) and Blundell and Bond (1998) we use system GMM procedure to estimate the coefficients.

The system GMM estimator is useful when:

– a panel has small number of time periods and large number of observations;

– a model is linear;

– the outcome variable is dynamic;

– covariates are not strictly exogenous and may be correlated with the error term;

– there is an unobserved heterogeneity in observations.

We use the moment conditions of the form:

$$E\left(\Delta y_{i,t-s}(\alpha_i + u_{i,t})\right) = 0 \; for \; s = 1 \ldots t-1$$

where $y_{i,t-s}$ is the outcome variable, α_i is the unobserved time-invariant individual effect, $u_{i,t}$ is the error term.

These moment conditions are valid under the assumption of:

$$E\left(Z_{SYS,i}^{T} P_i\right) = 0$$

where

$$P_i = \begin{pmatrix} \Delta u_i \\ u_{i,3} \\ u_{i,4} \\ \vdots \end{pmatrix}$$

and

$$Z_{SYS,i}^{T} = \begin{pmatrix} Z_{di} & 0 & 0 & 0 \\ 0 & \Delta y_{i2} & 0 & 0 \\ 0 & 0 & \Delta y_{i3} & 0 \\ \vdots & \vdots & \vdots & \ddots \end{pmatrix}$$

Speaking in words, the system GMM instruments the lagged variable with its lagged differences for all available periods $t - s$.

We estimated the baseline model for the two outcome variables: ROA and ROE, using three samples. The first sample contains all banks in the dataset we constructed. The second sample is restricted only to the banks from Asian countries. The third sample contains only banks from those countries that have both Conventional and Islamic banks. We believe that the third sample is reasonable because this may decrease the influence of unobserved country-specific effects. The results of the estimation are showed in table 3.12.

Table 3.12: Regression results for the first hypothesis

	Dependent variable:					
	ROA			ROE		
	(1)	(2)	(3)	(4)	(5)	(6)
Islamic	1,168***	0,395***	0,240***	11,713	3,304***	2,818***
	(0,394)	(0,111)	(0,090)	(7,884)	(1,256)	(0,719)
Advanced	0,704*			5,274		
	(0,392)			(7,852)		
lag(ROA)	0,027	0,477***	0,371***			
	(0,018)	(0,032)	(0,029)			
lag(ROE)				-0,009	0,186***	0,208***
				(0,024)	(0,016)	(0,014)
LTA	-0,002	0,001	0,001	0,099	-0,004	-0,014
	(0,005)	(0,002)	(0,002)	(0,098)	(0,028)	(0,016)
DTA	3,498***	0,966***	0,407*	46,986***	8,948***	4,005**
	(0,514)	(0,292)	(0,246)	(10,240)	(3,277)	(1,964)
EtTA	0,132***	0,029***	0,010**	0,531***	0,084	-0,013
	(0,007)	(0,005)	(0,004)	(0,135)	(0,056)	(0,034)
CtIR	-0,072***	-0,029***	-0,028***	-0,281***	-0,134***	-0,152***
	(0,003)	(0,002)	(0,001)	(0,049)	(0,015)	(0,009)
LogAssets	0,104***	0,068**	-0,005	-1,621***	1,061***	0,667***
	(0,031)	(0,028)	(0,024)	(0,611)	(0,319)	(0,193)
rGDPgrowth	-3,167	6,663***	2,153	148,710*	23,724	-2,072
	(4,079)	(1,523)	(1,354)	(81,629)	(17,176)	(10,797)
CPI	-0,041**	-0,008	0,001	-0,075	0,031	0,016
	(0,021)	(0,013)	(0,011)	(0,413)	(0,149)	(0,086)
IntRate	-0,012	-0,015***	-0,001	-0,468	-0,158**	-0,066*
	(0,018)	(0,006)	(0,005)	(0,359)	(0,063)	(0,038)
DepRate	-0,068*	0,019	0,024*	-0,621	0,004	0,146
	(0,041)	(0,017)	(0,014)	(0,815)	(0,192)	(0,114)
Observations	3166	1081	980	3166	1081	980
R^2	0,269	0,604	0,630	0,020	0,239	0,499
Adjusted R^2	0,266	0,597	0,623	0,016	0,227	0,490
F Statistic	96,736*** (df = 12; 3154)	89,962*** (df = 18; 1063)	90.816*** (df = 18; 962)	5,269*** (df = 12; 3154)	18,596*** (df = 18; 1063)	53,183*** (df = 18; 962)

Source: author's computations

Columns 1-3 contain coefficient estimates when the outcome variable is ROA and columns 4-6 contain estimates for ROE.

Column 1 shows the coefficient estimates for the full sample. The coefficient on Islamic variable is positive and significant which supports the hypothesis that Islamic banks conditional on the other variables have higher ROA on average. When the model is estimated on the restricted sample of the banks only from Asian countries (Column 2), the coefficient of interest is still positive and significant, but declines by almost 60%. In the column 3 we estimate the coefficient of the sample restricted to the banks only from the countries where both Islamic and Conventional banks are present. The coefficient on Islamic variable still positive and significant. Considerable drop of coefficient in columns 2 and 3 may be partially explained by country-specific unobservable effects that influence the outcome variable.

Column 4 displays a full-sample coefficient estimates for the outcome variable ROE. The coefficient on the Islamic variable is positive but not statistically significant. When we restrict the sample to only Asian countries and to the countries with both Islamic and Conventional banks, the coefficient becomes significant, but drops by almost 75%.

Thus, the regression results support the hypothesis that Islamic banks on average have higher profitability than Conventional banks controlled for bank-specific and country-specific variables.

We believe that there is no possibility of reverse causality, meaning that the level of profitability does not influence the decision of the bank whether to be Islamic or Conventional. The decision to open Islamic or Conventional bank is made when the bank is created and it depends on some unobserved preferences of bank owners, and not on its future profitability.

Thus, we do not reject our first hypotheses that Islamic banks on average are more profitable than conventional banks. Our findings are related to the results of Hassan and Bashir (2005), Iqbal (2001), Al-Jarrah and Molyneux (2005), Olson and Zoubi (2008), Rashwan (2010), Khediri et al (2015). All these papers report higher profitability of Islamic banks in different time-periods and different samples of countries. We also estimate our regression model on the sample of GCC countries and in line with Johnes et al (2009) find no higher profitability of Islamic banks for 6 GCC countries.

3.4. Analysis of Hypothesis 2

Hypothesis 2 states: Islamic banks are less stable than other banks.

The discussion about Islamic banks stability is less frequent in the literature than their profitability. Mohamad et al (2008) and Bader et al (2008) estimate no significant difference between conventional and Islamic banks in terms of stability. Later research of Beck et al (2013) shows that Islamic banks are less stable on average. Thus, our hypothesis contributes to the discussion, using a longer and more recent period and a wider sample of countries.

To verify whether Z-score depends on the bank's type we use a pooled OLS model where we regress Z-score on a "Islamic" dummy and other covariates. We exclude "equity to total assets" variable because it is included into Z-score calculation and may be perfectly correlated with the dependent variable.

The results of pooled OLS estimation are shown in Table 3.13. The first column is estimated on a full sample, the second column is estimated for the banks in Asian countries, and the third column uses only countries where Islamic banks are present.

Table 3.13: Regression results for the second hypothesis

	Dependent variable: Z-score		
	(1)	(2)	(3)
Islamic	*-4,087*	*-1,605*	*-13,064*
	-49,092	-19,907	-21,344
Advanced	*449,663***		
	-47,908		
LTA	*3,229****	-1,478***	-1,241***
	-0,585	-0,423	-0,472
DTA	*59,772*	-8,404	-26,043
	-56,374	-41,516	-45,806
CtIR	*0,006*	0,004	0,067
	-0,257	-0,198	-0,214
LogAssets	*-11,765****	13,820***	14,315***
	-3,649	-2,267	-2,451
rGDPgrowth	*-483,893*	-717,928***	-1,056,832***
	-492,096	-252,206	-283,205
CPI	*-5,423***	-12,910***	-14,829***
	-2,486	-2,158	-2,369
IntRate	*-4,359***	-2,435***	-2,313**
	-2,194	-0,924	-1,058
DepRate	*16,051****	14,355***	17,864***
	-4,931	-2,816	-3,207
Observations	*4351*	1382	1242
R^2	*0,034*	0,041	0,048
Adjusted R^2	*0,032*	0,035	0,041
F Statistic	15,394*** (df = 10; 4341)	6,449*** (df = 9; 1373)	6,822*** (df = 9; 1233)

Source: author's computations

We see that type of a bank has no significant effect on the stability. On contrast, country-specific covariates have statistically significant effect. CPI, loan interest rate and real GDP growth negatively affect bank stability, while deposit rate have a positive impact on Z-score. Among bank-specific covariates we see only loans-to-assets ratio and log assets

size are significant. The former has an ambiguous effect, while the latter negatively impacts the outcome variable. Thus, we can suggest that larger banks have lower stability.

Hypothesis 2 stated in the beginning of the thesis assumed that Islamic banks are less stable than other banks.

First, our summary statistics show that in 2013-2016 mean value of Z-score for Islamic banks is significantly lower than for conventional banks, suggesting that Islamic banks are less stable. This confirms our hypothesis.

On the other hand, results from estimated regression, show that conditional on other control variables the type of a bank does not have an impact on its stability. This result to some extent goes in line with findings of Cihak and Hesse (2016), where financial stability of Islamic and conventional banks is subject to the bank size. In our regression size of the bank, measured by logarithm of assets, has also significant effect, although the sign of the effect changes. For the whole sample, where conventional banks dominate, the effect of size is negative (suggesting that the large banks are less stable), while for Asian countries or countries with Islamic banks presence the size has positive effect.

Thus, our estimation does not give enough evidence in favor if the second hypothesis and, thus, we reject the hypothesis that Islamic banks are less stable than conventional ones. Our results go in line with papers of Mohamad et al (2008), Bader et al (2008), who report no significant difference in stability between Islamic and conventional banks. On the other hand, Beck et al (2013), controlling for the bank size obtained statistically

significant effect of bank's type on bank stability. This difference may arise due to the different methodology used. Beck et al (2013) use fixed-effects regression while we estimated the effect of Islamic bank by pooled OLS.

3.5. Analysis of Hypothesis 3

Hypothesis 3 states: The level of women participation in financial activities of Muslim countries depends on the degree of Islamic banking penetration.

There is almost no academic discussion on the relationship between Islamic banks development and women participation in financial activities. The paper of Uddin et al (2017) has some relevance as the authors discuss the interdependence of socio-economic factors and Islamic banks development. Also Haider et al (2017) report that men and women differently react on the Islamic banks products.

There is also some evidence on the role of Islamic banks in women participation in financial activities coming from non-academic publications. For example, Pasha (2010) claims that the growing share of women-owned businesses in the Muslim countries might trigger the expansion of Islamic banks services. The more recent article in Islamic Finance News (2015) also suggests that women are a potential for Islamic banks expansion in the Muslim countries.

For the third hypothesis we use data on share of Islamic and conventional banks deposits and loans to countries' GDP as a main indicator of each type's market share. As outcome variables, measuring the level of gender participation in financial system, we use shares of male and female having saving account, debit card, credit card, and borrowed from

financial institutions. As additional controls we use macroeconomic variables that may influence the outcome variables.

Due to the data issues, we have the outcome variables only for 2011 and 2014 (obtained from The Global Findex Database on financial inclusion around the World). Thus, covariates are collected also for these two years. Moreover, we restrict the sample only to the countries, where both Islamic and conventional banks operate. This gives us an opportunity to disentangle the effect of each type on financial participation of men and women.

Our baseline specification for the regression is:

$$FP_{i,g,t} = \alpha \cdot IBS_{i,t} + \beta \cdot CBS_{i,t} + \gamma \cdot X_{i.t} + \delta_t + \varepsilon_{i,t}$$

Where $FP_{i,g,t}$ is a measure of financial participation for gender g, in country i at year t, $IBS_{i,t}$ is a share of Islamic banks deposits (or loans) in GDP of country i, $CBS_{i,t}$ is a share of conventional banks deposits (or loans) in GDP of country i, $X_{i.t}$ is a vector of covariates.

According to our hypothesis, the sign of α should be positive for female participation measures.

To estimate the model, we use pooled OLS (due to the lack of time periods) separately for each measure of financial participation for men and women. The results are displayed in tables 3.14 and 3.15.

Table 3.14: Regression of female financial participation measures on market shares of Islamic and conventional banks

	Dependent variable:			
	Saving account	Debit card	Credit card	Borrowed
	(1)	(2)	(3)	(4)
Islamic banks deposits to GDP	*0,002*	*0,246*		
	-0,193	-0,253		
Conventional banks deposits to GDP	*0,126***	0,147**		
	-0,04	-0,052		
Islamic banks loans to GDP			*0,119*	*0,13*
			-0,176	-0,085
Conventional banks loans to GDP			*0,122***	0,024
			-0,038	-0,018
Real GDP growth	*0,123****	*0,138***	*0,03*	*0,024*
	-0,039	-0,051	*-0,031*	-0,015
Inflation	*0,039*	0,04	*0,014*	0,011
	-0,042	-0,055	*-0,032*	-0,015
Deposit Rate	*-0,054*	-0,230**		
	-0,068	-0,089		
Lending Rate			*-0,071*	*-0,006*
			-0,05	-0,024
Observations	*26*	*26*	*26*	26
R^2	*0,048*	0,254	*0,195*	0,063
Adjusted R^2	*-0,134*	0,112	*0,042*	-0,116
F Statistic (df = 5; 21)	*-0,554*	1,171	*0,994*	0,074
Note:				*p **p ***p<0.01

Source: author's computations

Surprisingly, for women participation on financial services we observe positive and significant relationship with conventional banks shares, but not with Islamic banks. Since the estimation procedure does not reveal the causality, we just may state that female participation and conventional banks expansion go in the same direction. Nevertheless, this interesting result may suggest that conventional banks are able to attract more female clients than their Islamic counterparties.

Table 3.15: Regression of male financial participation measures on market shares of Islamic and conventional banks

	Dependent variable:			
	Saving account	Debit card	Credit card	Borrowed
	(1)	(2)	(3)	(4)
Islamic banks deposits to GDP	*0,007*	*0,519***		
	-0,176	-0,245		
Conventional banks deposits to GDP	*0,134****	0,171***		
	-0,036	-0,051		
Islamic banks loans to GDP			*0,305*	*0,246***
			-0,204	-0,097
Conventional banks loans to GDP			*0,139****	0,041*
			-0,044	-0,021
Real GDP growth	*0,160****	*0,179****	*0,056*	0,039**
	-0,036	-0,05	*-0,036*	-0,017
Inflation	*0,042*	0,041	*0,009*	0,001
	-0,038	-0,053	*-0,037*	-0,017
Deposit Rate	*-0,098*	-0,265***		
	-0,062	-0,087		
Lending Rate			-0,098	-0,001
			(0,058)	(0,028)
Observations	*26*	*26*	*26*	*26*
R^2	*0,184*	0,42	0,222	0,208
Adjusted R^2	*0,028*	0,31	0,073	0,057
F Statistic (df = 5; 21)	*0,16*	2,636*	1,135	0,676
Note:				*p **p ***p<0.01

Source: author's computations

For the male participation in financial services we observe slightly different picture, where share of men having debit card and borrowed from the financial institution is significantly correlated with Islamic banks activities. At the same time, conventional banks have also positive but somewhat lower effect on male participation. These results suggest that Islamic banks rely more on male clients and oversee women as potential clients and source to increase bank operations.

These findings to some extent refute the suggestions made by Islamic Finance News (2015), where the authors claimed women to increase their participation in Islamic banking activities. There is a lack of academic literature on this particular topic, thus, we cannot provide other sources. Thus, our third hypothesis that the Islamic banking expansion involves women into broader financial participation is rejected. On contrast, it is conventional banks expansion that is correlated with women financial participation.

3.6. Summary of results

Overall results of our master thesis suggest that Islamic banks are more profitable on average than their conventional counterparties. These findings are confirmed for the whole sample if Asian and European countries, for the sample of countries with Islamic banks and for Asian countries.

We reject the hypothesis that Islamic banks are less stable, because our estimation provides no statistically significant effect of the bank type on Z-score. Although, t-test for the difference in means shows for some years significant results.

We also reject the hypothesis that the development of Islamic banks involves more women into financial activities. On contrary, it is the expansion of conventional banks that positively correlated with the growth of women who use banking services in countries with Islamic banks.

Our findings on the first hypothesis support the results of Hassan and Bashir (2005), Iqbal (2001), Al-Jarrah and Molyneux (2005), Olson and Zoubi (2008), Rashwan (2010), Khediri et al (2015). Our research together with the mentioned papers estimate higher

profitability of Islamic banks. To verify, whether the results of Johnes et al (2009) contradict our estimation, we estimate our regression model on the sample of GCC countries and find no effect of Islamic banks on the profitability.

The rejection of the second hypothesis goes in line with the findings of Mohamad et al (2008) and Bader et al (2008), These authors obtain that the stability of banks does not depend on their type (Islamic or conventional). Our results contradict findings of Beck et al (2013), who estimate that Islamic banks are significantly less table than conventional banks.

The analysis of the third hypothesis shows that the level of women participation in financial activities is correlated with the expansion of conventional, not Islamic, banks. This contradicts suggestions made by Pasha (2010) and Islamic Finance News (2015).

Table 3.16 presents our results compared with the results of other authors.

Table 3.16: Comparison of the results with existing literature

Hypothesis	Decision	In line	Against
Islamic banks are more profitable than conventional banks	Not rejected	Hassan and Bashir (2005), Iqbal (2001), Al-Jarrah and Molyneux (2005), Olson and Zoubi (2008), Rashwan (2010), Khediri et al (2015)	
Islamic banks are less stable	Rejected	Mohamad et al (2008), Bader et al (2008), Johnes et al (2009)	Beck et al (2013)
The level of women participation in financial activities of Muslim countries depends on the degree of Islamic banking penetration	Rejected		Islamic Finance News (2015), Pasha (2010)

Source: author's computations

4. Conclusion

This master thesis has an objective to describe the key differences between Islamic and conventional banks using profitability and stability as main features. The three hypotheses were stated. Hypothesis 1: Islamic banks have higher profitability on average; Hypothesis 2: Islamic banks are less stable on average; Hypothesis 3: The level of women participation in financial activities of Muslim countries depends on the degree of Islamic banking penetration

Using statistical and system GMM analysis the following results were obtained. First, the evidence supports the first hypothesis which means that Islamic banks indeed report higher profitability in terms of ROA and ROE than conventional banks. The possible explanation to this is the limited participation of Islamic banks in speculative operations which incurs less losses and greater stability of their profits. Usually Islamic banks are more prudent with their financial activities and tend to be less dependent on external sources of funding which means less interest costs and higher relative net interest margin. Our results support the evidence of Hassan and Bashir (2005), Iqbal (2001), Al-Jarrah and Molyneux (2005), Olson and Zoubi (2008), Rashwan (2010), Khediri et al (2015) Using different techniques and samples these authors estimated higher profitability of Islamic banks, which might be the robust evidence in favor of our hypothesis.

The second hypothesis was rejected based on the estimated regression. It shows that Islamic banks do not have a significant difference in terms of financial coefficients

volatility together with Z-score. These results are similar to the works of Mohamad et al (2008) and Bader et al (2008), who also report no significant difference in stability of Islamic and conventional banks. Although, our results contradict findings of Beck et al (2013), we address this to the different methods and samples used.

The third hypothesis is also rejected. We estimated that the level of women participation in financial activities is significantly correlated with the development of conventional, not Islamic, banks. It is not clear, what is the channel of this correlation, but this may be a way of another separate research. Our findings refute the claims made by non-academic articles of Pasha (2010) and Islamic Finance News (2015) that women provide a potential for the further expansion of Islamic banks. On contrast, the broader women participation is correlated with the growing market share of conventional banks.

Based on our findings we may suggest that the development of Islamic banks in Azerbaijan might contribute the increase in profitability of the whole banking system without significant reduction in its stability. In addition, the expansion of Islamic banks in Azerbaijan may be supported mostly by men, as our results suggest.

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