St. Petersburg University
Graduate School of Management
Master in Corporate Finance Program

SUKUK BONDS AS AN ALTERNATIVE SOURCE OF FUNDING: RISKS AND IMPLICATIONS

Master's Thesis by the 2nd year student
Concentration – Master in Corporate Finance
Dalal Adel

Research advisor:
Okulov Vitaly Leonidovich,
Associate Professor

St. Petersburg
2017

ЗАЯВЛЕНИЕ О САМОСТОЯТЕЛЬНОМ ХАРАКТЕРЕ ВЫПОЛНЕНИЯ ВЫПУСКНОЙ КВАЛИФИКАЦИОННОЙ РАБОТЫ

Я, Далал Адель, студентка второго курса магистратуры направления «Менеджмент», заявляю, что в моей магистерской диссертации на тему «Сукук облигации как альтернативный источник финансирования: ключевые риски и применения», представленной в службу обеспечения программ магистратуры для последующей передачи в государственную аттестационную комиссию для публичной защиты, не содержится элементов плагиата.

Все прямые заимствования из печатных и электронных источников, а также из защищенных ранее выпускных квалификационных работ, кандидатских и докторских диссертаций имеют соответствующие ссылки.

Мне известно содержание п. 9.7.1 Правил обучения по основным образовательным программам высшего и среднего профессионального образования в СПбГУ о том, что «ВКР выполняется индивидуально каждым студентом под руководством назначенного ему научного руководителя», и п. 51 Устава федерального государственного бюджетного образовательного учреждения высшего профессионального образования «Санкт-Петербургский государственный университет» о том, что «студент подлежит отчислению из Санкт-Петербургского университета за представление курсовой или выпускной квалификационной работы, выполненной другим лицом (лицами)».

(Подпись студента)

24/05/17 (Дата)

STATEMENT ABOUT THE INDEPENDENT CHARACTER OF THE MASTER THESIS

I, Dalal Adel, second year master student, Master in Corporate Finance program «Management», state that my master thesis on the topic “Sukuk bonds as an alternative source of funding: key risks and implications”, which is presented to the Master Office to be submitted to the Official Defense Committee for the public defense, does not contain any elements of plagiarism.

All direct borrowings from printed and electronic sources, as well as from master theses, PhD and doctorate theses which were defended earlier, have appropriate references.

I am aware that according to paragraph 9.7.1. of Guidelines for instruction in major curriculum programs of higher and secondary professional education at St. Petersburg University «A master thesis must be completed by each of the degree candidates individually under the supervision of his or her advisor», and according to paragraph 51 of Charter of the Federal State Institution of Higher Professional Education Saint-Petersburg State University «a student can be expelled from St. Petersburg University for submitting of the course or graduation qualification work developed by other person (persons)».

 (Student’s signature)

24/05/17 (Date)

АННОТАЦИЯ

Автор	Далал Адель
Название магистерской диссертации	«Сукук облигации как альтернативный источник финансирования: ключевые риски и практическое применение»
Факультет	Высшая школа менеджмента
Направление подготовки	080200 “Менеджмент” (Профиль: Корпоративные финансы)
Год	2017
Научный руководитель	Виталий Леонидович Окулов, к.ф.-м.н., доцент
Описание цели, задач и основных результатов	Наряду с текущими трендами по глобализации и интеграции региональных экономик, а также с растущим интересом инвесторов к диверсификации своих портфелей, увеличивается спрос на Исламские облигации, известные как сукук. Целью данной работы является исследование уникальныз рисков сукук облигаций. Для этого были проанализированы принципы Исламских бумаг, схемы финансирования, рассмотрены современные исследования в области ценообразования и рисков, в результате чего были выявлены факторы, которые могут влиять на цену сукук. В рамках работы был проведен эконометрический анализ взаимосвязи цены Исламской облигации с различными факторами. Выборка состояла из цен сукук облигаций в период 2014-2017 гг., выпущенных на территории Малайзии. Результаты исследования подтвердили наличие положительной взаимосвязи между ценой сукук и ценой базового актива. Кроме того, была выявлена положительная взаимосвязь между ценами Исламской и традиционной облигации, выпущенными одним эмитентом. Было также установлено, что ставка LIBOR является незначимым фактором в цене сукук. Выводы данной работы подтверждают связь сукук с реальной экономической деятельностью. Более того, независимость Исламских инструментов от рынков, где разрешена процентная ставка, также была проверена эконометрическим анализом. Таким образом, сукук облигации могут быть рассмотрены как альтернативный источник финансирования, предоставляющий возможность для диверсификации, секьюритизации и фондирования проектов в развивающихся странах.
Ключевые слова	Облигации, сукук, исламские финансы, принципы Шариата, оценка, риски, диверсификация, секьюритизация, Малайзия

ABSTRACT

Master Student's Name	Adel Dalal
Master Thesis Title	“Sukuk bonds as an alternative source of funding: risks and implications”
Faculty	Graduate school of management
Main field of study	080200 “Management” (specialization: Master of Corporate Finance)
Year	2017
Academic Advisor’s Name	Vitaly L. Okulov, PhD in Physico-mathematical sciences, Associate Professor
Description of the goal, task and main results	Along with current trends towards globalization and integration of regional economies, as well as the growing interest among investors for diversification lead to an increase in demand for sukuk. The goal of this paper is to investigate unique factors of risks of Islamic bonds. To achieve the defined research goal, we have briefly investigated principles of sukuk and structures of funding process, analyzed theoretical approaches of sukuk risks and reviewed contemporary research on pricing of Islamic bonds and possible factors of sukuk price. For the purpose of the study we have conducted an econometric analysis on the time-series sample of three currently tradable sukuk issuances originated in Malaysia. Our findings confirmed the positive relationship between the sukuk price and price for underlying asset. Moreover, we have determined the positive relationship between sukuk price and conventional bonds’ price of the same issuer. LIBOR was found to be insignificant to the price of sukuk certificate. Results of this analysis confirm the linkage of sukuk to real economic activities, as the prices of bonds are correlated with underlying assets. Furthermore, findings showed that the independence of Islamic bonds from interest-based markets is proved, since sukuk prices are not linked to LIBOR. For this reason, we propose to consider sukuk as an alternative source of funding, which provides a new framework for global financial system, and possesses the high potential for diversification, securitization and developing of emerging markets.
Keywords	Bonds, sukuk, Islamic finance, Shariah-compliance, pricing, risks, diversification, securitization, Malaysia.

Table of Contents

INTRODUCTION

Sukuk have already become a frequent financing mean in Muslim countries, giving the opportunity of significant cross-border flow of funds. Moreover, this bond turned into one of the fastest growing financial instruments in the world. According to Rabindranath and Gubta (2010), sukuk issuances totaled a cumulative value of 106.6 billion dollars from December 1996 to September 2009 globally. Malaysia is a leading country, sharing 46% of issues value; GCC region accounts for 49% and remaining 5% held for other countries from the rest of the world (Naifar, 2013).

There are several reasons that stand behind the current expansion of sukuk. Following the current trends towards globalization and integration of regional economies, percentage of the population professing Islam has increased in Western countries. A new round of development for Islamic financial products started in 2008, when uniqueness of such instruments helped to avoid consequences of economic crisis and, in that way, presented their diversification benefits. This phenomenon, as well as the growing interest of investors in geographical diversification of their investment portfolios, leads to increased demand for products offered by Islamic financial institutions. Simplicity of popular sukuk structures, which resembles some features of conventional bonds, is interesting for investors, since it is more convenient to face with something being already known.

Although interest in sukuk among Western countries is growing, Islamic markets are still in their infancy and do not provide enough liquidity in terms of secondary market development and number of issuance and agents. The principal challenge associated with sukuk funding is a lack of empirical research, which results in absence of pricing models specifically adjusted to the uniqueness of these instruments. On the contrary, available information shows that some sukuk issuances are priced with the traditional bonds valuation techniques. Moreover, risk management tools for sukuk have been not developed yet, as well as, a thorough analysis of possible implications.

A lack of research on matter of sukuk pricing, implying and managing added with application of conventional models to sukuk arises the situation, where experts tend to believe Islamic bonds have no difference from traditional debt obligations. Thus, the financial innovation of sukuk bonds is being questioned, stating that their unique characteristic is only legal, Shariah compliance. Other fundamental principles, as linkage to real economic activities and independence from interest rates, have not been empirically tested yet.

Thus, a detailed analysis of sukuk bonds, their distinctive features and characteristics is necessary.

The research goal of this study is to determine unique factors of risks of sukuk, which have influence on price of Islamic bonds. The primary subject of the master thesis is a price of sukuk bond.

In order to achieve the defined research goal, we set the following objectives:

- To identify sukuk principles and types of sukuk structures;
- To review a contemporary scientific research on sukuk pricing;
- To conduct an empirical study with sukuk price as an independent variable and price factors as explanatory variables;
- To analyze the obtained factors and to determine key risks that are connected to sukuk price;
- To provide possible implications of sukuk as an alternative source of funding.

This paper provides an empirical research, where we used an econometric analysis with the help of Stata software.

The main sources of information for literature review are resolutions of AAOIFI, which define the definition and principles of sukuk; academic articles devoted to sukuk risks and pricing; professional periodical literature devoted to Islamic financial sphere (Islamic Banker, Journal of Islamic Banking & Finance, International Journal of Islamic Financial Services, Journal of Applied Finance and Banking and others); analytical reports of global financial companies (Fitch, Deloitte, Goldman Sachs) and prospectuses of sukuk issuances. Additionally, for the purpose of regression analysis we collected data on tradable sukuk from Thomson Reuters Datastream and Sukuk databases.

We provide the following structure in order to achieve the main goal of the study. The first stage of this paper is devoted to a thorough analysis of sukuk: the main principles, the market of sukuk bonds, the mechanisms of their functioning, and risks associated with this instrument. Moreover, we consider existing pricing analyses of sukuk and highlight possible factors that may influence the price of an Islamic bond.

In the second chapter, we describe the research methodology applied, sample selection and the descriptive statistics of the selected variables. We conduct a multistep regression analysis for three issuers of sukuk and define, what factors are significant in sukuk price determination and what type of relationship (positive or negative) each factor has with the dependent variable (sukuk price).

The third chapter is a discussion of sukuk risks, which include unique risks and those, that also refer to conventional bonds. Based on risks highlighted, we provide possible implications of sukuk that may be beneficial for investors. Finally, our analysis may make a further step in determining whether sukuk bonds are an alternative source of funding with unique

characteristics, or the principles stated by Islamic financing are only a marketing trick for investors and are not implied in real sukuk issuances.

CHAPTER 1. THEORETICAL RESEARCH OF SUKUK RISKS AND PRICING MODELS

1.1. Definition of sukuk

To get a thorough understanding of sukuk we will start with the discussion of general concepts of Islamic finance and Shariah-compliant bonds, in particular. Thus, the first chapter of the paper begins with terminology and main principles of Islamic finance. Then, we move to the Islamic financial products and review the most popular one – sukuk bond. We consider the definition of sukuk, their common types, structures of cash payments and recent issuances.

Arab economist S. Abdullah (2004) defines Islamic financial system as the conduct of financial transactions in accordance with Shariah law, assuming prohibition of unjustified risks, interest rates, speculating, and any reference to production of alcohol, tobacco and pork.

It is necessary to highlight certain Islamic law prohibitions in economic sphere that differentiate Islamic financial institutions from traditional.

The most principal one is the prohibition of interest rate ("riba" - the surplus), which refers to any unjustified increment of capital in the implementation of a trade transaction or loan. Profits derived form a fixed rate that is independent on a result of investment project, is rejected, since it does not reflect a real contribution of agents to economic development and does not lead to an increase in social welfare. Although it is the main feature of Islamic finance, there has been a debate regarding this ban, in particular, the inexpediency of canceling interest is considered from the perspective of needs of the modern economy. Thus, according to Fazlur Rahman (1982), before the global economy shifts to the Islamic model, the prohibition on interest collection will be detrimental to the economic development, and will also conflict with the Quran and the Sunnah. Disputes continue on the issue of the inflationary nature of the modern economy. In this case, the absence of "riba" during inflation period will lead to a negative real interest rate, which penalizes the lender, but benefits the borrower. In a similar vein, Mohammed Said al-Ashmawi (2007) supports the groundlessness of canceling the interest by two arguments. First, initially this prohibition was applied to six commodities, not conforming to modern ones. Secondly, it is necessary to distinguish between loans, which in future periods are able to bring economic benefits, and those that are exploitative. And based on the type of loan, decide whether to apply interest or use profit and loss sharing scheme between lender and borrower. However, none of the studies carried out an empirical analysis of this phenomenon.

The second prohibition is a ban on deliberate risk ("gharar"), which goes beyond the scope of randomness and under which, in general, any speculative situation falls. Maxim Rodinson (1974) defines "gharar" as any benefit derived from unforeseen circumstances such as crop yield, natural disasters, etc. Separately, the prohibition of speculative behavior in Islamic law is called

"maysir", which impedes applying of derivative financial instruments, since with them a significant risk is associated.

With the introduction of the above-mentioned prohibitions, the criterion of profitability, essential for business valuation, cannot be dominant for cases of compliance with Muslim standards. From the moment of foundation, the goal for objects of Islamic financial system was not to maximize profits, but to ensure public welfare. According to the International Association of Islamic Banks (IAIB), activities of Islamic banks must fulfill both material and socially-oriented tasks. Profitability, despite its importance and priority, is not a determining criterion in the evaluation of results. As they were implemented, financial institutions serve public interests and play a significant role in the field of social security. To IAIB, duty of banks to the society are understood as an integral part of the financial system.

Notable increase in funding based on Shariah principles and its expansion into new markets, including countries where most of the population does not profess Islam (for example, Great Britain), exacerbates competition with traditional financial institutions. The latter are aimed primarily at maximizing profits, which attracts investors and shareholders, and also allows the creation of funds for investing in innovation and marketing.

Despite the challenges mentioned above, financial institutions of Muslim countries have been no more considered as a phenomenon of Islamic revivalism, on contrary, they became an integrated part of global economic system. Undoubtedly, the volume of financial transactions based on Islamic ethics is relatively small, however, this area has already attracted attention of major Western financial centers. In June 2014, the UK decided on the first sovereign issue of sukuk; Hong Kong, South Africa, Luxembourg and Senegal already implemented their debut releases in the same year. Following them, their plans to enter the market of Islamic securities announced the countries of Africa (Kenya, Egypt, Tunisia, Nigeria). The requirement for an underlying asset in sukuk financing schemes is attractive for the north of the continent as an opportunity to raise funds for infrastructure projects (e.g. oil pipelines).

As for the products, Islamic financial industry created a range of contracts acceptable under Muslim legal doctrine and adapted conventional contracts so they comply with the principles of Shariah. There are three main type of products:

- Profit and Loss-sharing instruments (musharaka and mudaraba);
- Mark-up contracts (murabaha and ijara);
- Sukuk.

Profit and Loss-sharing contracts (PLS) are based on risk participation and are presented by musharaka and mudaraba contracts. In musharaka (partnership) contract both parties are involved in implementation and management of a project, and profits generated by it are divided

according to the prespecified terms. Losses are distributed in proportion to the capital contributed. Under a mudaraba contract investor gives money to the entrepreneur, who is commited to manage the given amount to make profit. However, it is different from the former type of PLS agreement. While in musharaka contract both parties are participated in financing the project, under a mudaraba contract capital is fully given by the investor (often, bank). The investor also pays losses, if occurred. Borrower is fully responsible for running the project, however all assets purchased with the investment remain the property of lender. Both of these tools are long-term in their nature and are suitable for joint ventures and project financing.

Mark-up contracts are often used for consumer credit and short or medium-term financing. The most popular types are murabaha (sale) and ijara (leasing) contracts. Such contracts entail mark-up on a good purchased by the funds invested. Under a murabaha contract one party buys an asset and sells it to another party at a higher price, which is payable at the end of a contract. They are also associated with the collateral, such as the ownership of goods underlying the transaction. Under ijara contact one party leases a good to another for a fee, determined by the way this good will be used. Thus, the gain of the lender is dependent on the gain achieved by the using of the asset.

In 2008, the Accounting and Auditing Organization for Islamic Financial Institutions (AAOIFI), the body that developed standards for Arab economies, defined sukuk as equal value certificates that provide an indivisible share of ownership in tangible assets and services, related to a project, the right to use them and generate income. Moreover, authorities such as the Islamic Fiqh Academy Council and the Islamic Bank of Development prohibited all traditional types of bonds for which the issuer pays interest, regardless of whether a body that issued a security belongs to the private sector or to the state. In recent years, sukuk bonds have become an increasingly popular mean of raising capital for companies through corporate sukuk and funding of the state treasury through sovereign issues. According to the Global University of Islamic Finance, sukuk share 14% of overall assets of Islamic finance.

A distinctive feature of the Islamic bond is its non-debt "nature": instead of obligation it provides a share in the underlying assets (Ariff, Safari, Mohammad, 2012). Asset-backing can be considered as a fundamental principal of sukuk bonds, which places quantity limits on excessive borrowing. Overreliance on borrowed funds has become a root cause of many bankruptcies, leading to economic crises.

The second feature of Islamic bond is the profit ratio in determining return received by investors, used in several sukuk structures. Hence, fund providers bear a risk concerning project implementation, since profit generated by the project is known only after borrowed fund has been applied to economic activity. For example, in case of damage of assets used in backing of

sukuk, payments will be no reward or a part of it provided to investors. Profit ratio in this case depends on the riskiness of a project. For projects with insignificant risk, profit ratio can be established as 60% to issuer of a bond and 40% to investor.

Another characteristic of sukuk concerns to the ethical aspect of this security. It is that all projects to which funding is supplied should be engaged in economic production or service, that increases social welfare. Firms related to gambling, production of pork, tobacco, alcohol are not allowed to receive funding by sukuk issuance. This statement introduces a high moral aspect of debt obligation. It means that sukuk is able to discourage growth of prohibited activities in Islamic countries.

Distinctive features of sukuk bonds are summarized in Table 1.

Table 1.

Comparative analysis of principles of sukuk and conventional bonds

Principles of a deal designing	
Sukuk	**Conventional bonds**
Ownership of assets	No ownership of assets
Pricing by profit from underlying assets	Pricing by interest rate
Profit after risk-sharing	No risk-sharing
Reward to investor after income earned	Reward paid even if no income earned
Payments: fixed or variable	Payments: fixed or variable

In modern economic theory, various classifications of Islamic bonds are proposed. The unified classification of Islamic securities is presented in AAOIFI FAS 17. In general, bonds are based on types of Islamic financing modes described earlier in this chapter: profit and loss-sharing, mark-up financing and, additionally, charitable participation. The common feature of all types is a presence of Special Purpose Vehicle (SPV), to which a borrower sets a portion of its' income-producing assets. The main goal of SPV is to provide service to investors over the contract period using payments from the company-obligator (Ariff, Safari, Mohammad, 2013). Most types of sukuk do not involve actual sale of underlying assets, they are, rather, temporary placement to raise funds.

Common sukuk securities are represented by six types as follows:

- Joint enterprise (musharaka);

- Partnership in profit (mudaraba);
- Mark-up financing (murabaha);
- Lease (ijara);
- Advanced payment for forward purchase of goods (salam);
- Agency agreement (wakala).

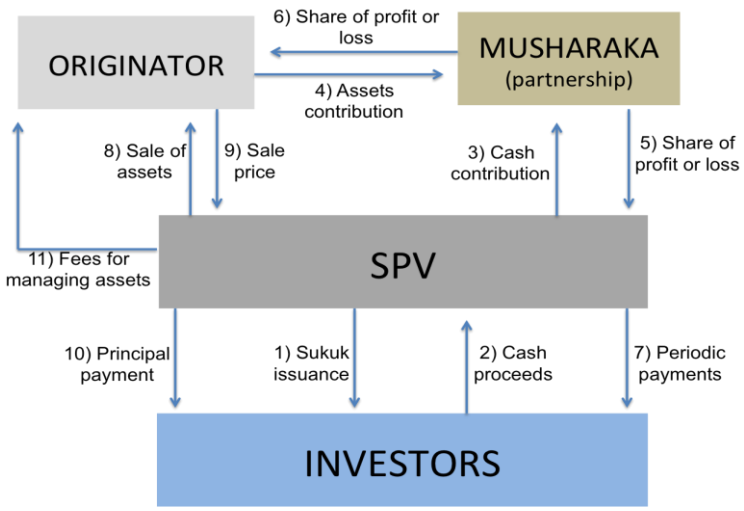
To understand the pricing determinants of sukuk in our further study, we clarify each type of sukuk: provide the general definition, recent issuances and payment scheme.

Musharaka sukuk is a participatory type of sukuk. It is used for financing large scale projects and business activities on the basis of equity partnerships. Special Purpose Vehicle (SPV) or partnership is established to issue bonds and accumulate funds from their sale. The main aim of partnership is to maintain a certain project and generate profit (or loss). The bond holders become the owners of the project or the assets respectively to the share in musharaka partnership, which implements project and generates profit. It can be permanent ownership (period of a contract is not specified) or diminishing (the rate of ownership is periodically reduced). All investors are entitled to participate in the project, however they are not obliged to do so. The profits are distributed among the parties at pre-agreed ratio, while the losses are borne by the parties in proportion with the capital contributed. Musharaka sukuk can be bought and sold on secondary market. At maturity, if the project generates enough profit for borrower to buy back assets from the partnership, sukuk holders will receive the face value of bonds.

In such type of contract there are four parties: borrower (originator), investors, SPV and partnership. The structure involved in musharaka sukuk are presented below.

Figure 1.

Structure of musharaka sukuk



One of the examples of musharaka sukuk issuance was originated in November 2010 by Abu Dhabi Islamic Bank. This issue is listed on Nasdaq Dubai and totaled USD 750 mln, where

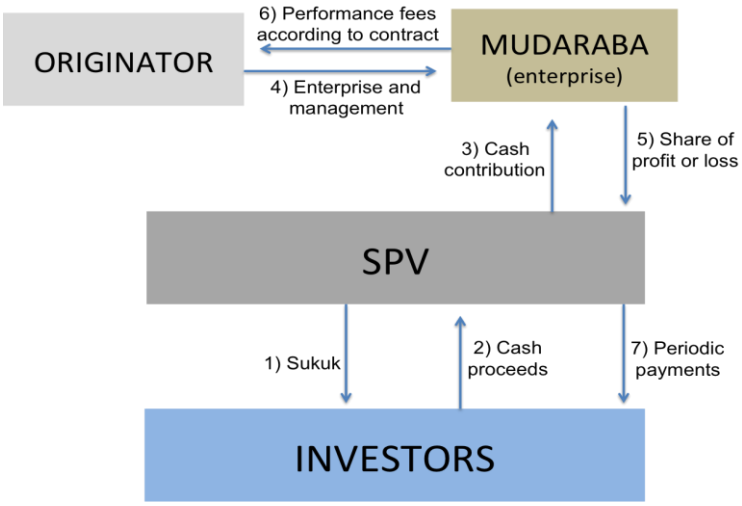
Barclays Capital and HSBC acted as arrangers.

Mudaraba is an operation where one side, investor, contributes capital to the enterprise, the other party, in turn, supplies physical and human resources or takes on managerial activity. The structure of mudaraba funding was taken as an underlying structure for mudaraba sukuk, where each bond represents the ownership of assets (so called mudaraba capital). The returns to the investors represent profit accrued from the underlying assets, firstly, divided between investor and borrower at pre-specified ratio and, secondly, distributed to each certificate holder proportionate to the investment.

The structure of sukuk mudaraba is as follows:

Figure 2.

Structure of mudaraba sukuk



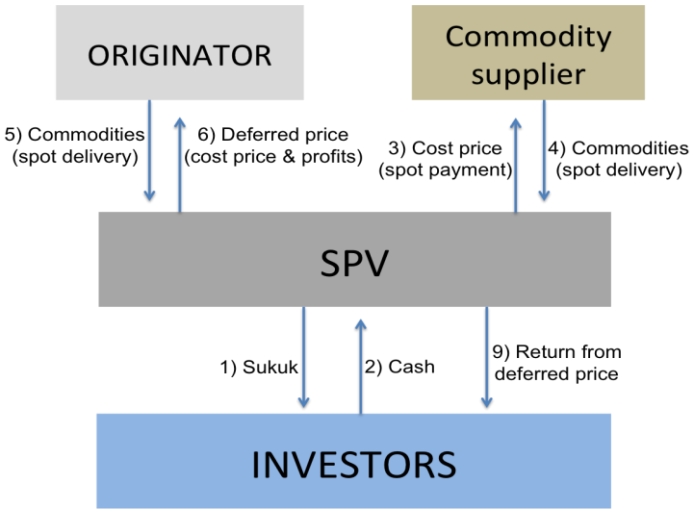
Perpetual mudaraba sukuk were recently originated by Warba Perpetual (Kuwait), with the size of USD 250 million. Bonds were issued in March 2017 and have a coupon rate at 6.5%.

Murabaha sukuk are based on the corresponding transaction for realization of goods purchased by bank at client's request. Selling price of goods is determined by the parties as the sum of purchase price and mark-up, which is agreed upon (Ismail, 2002). However, in most cases, securities more often repeat the concept, in which seller delivers the goods at a predetermined price with a deferred payment with further buyback at a price lower than the agreed price. Due to this feature, murabaha sukuk are considered as debt securities, that is why transactions with them in the secondary market are prohibited by Islamic law.

More detailed scheme of murabaha sukuk payments is presented below.

Figure 3.

Structure of murabaha sukuk



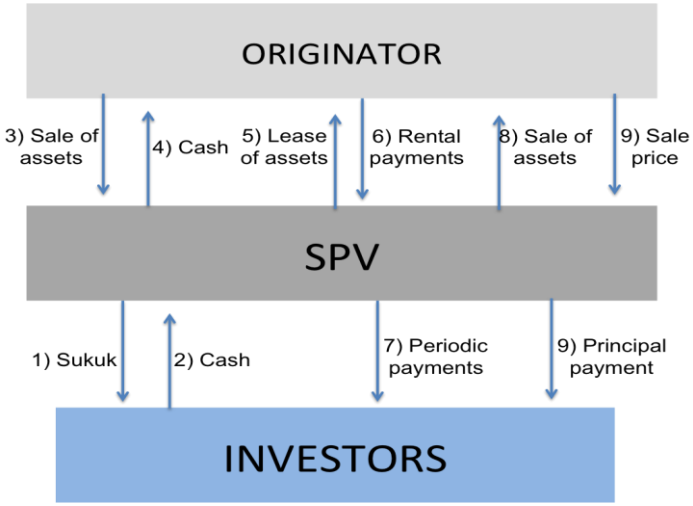
For example, murabaha type of sukuk was issued by Emaar 2026 with the size of USD 750 mln, maturity date in 2026 and a coupon rate of 3.635%.

The complexity of organizing funding by murabaha sukuk was shown by unsuccessful trial of one of the biggest banks. In 2011, issuance of murabaha $2 bln bonds by Goldman Sachs was planned on the Irish Stock Exchange. However, it was soon withdrawn because of sharp criticism from both, Western banking sector and Islamic economic school. The main reason was violation of Islamic principles: prohibition of speculation and interest. Western financial institutions will require involvement of experts in Islamic finance for additional consultations and approval of prospectuses, which increases the cost of borrowed funds.

Ijara sukuk are certificates of equal value issued by the owner of assets either on her own or by a financial intermediary, for the purpose of leasing it against a rental. After subscription sukuk holders become the owners of underlying asset. This structure is quite popular among Arab companies, which, according to experts, is explained by the simplicity of the basic operation and the favor of Shariah scholars towards this scheme. The scheme involves mainly three parties (borrower, investors and SPV) and consists the common steps as follows.

Figure 4.

Structure of ijara sukuk



As it was stated, ijara sukuk are widely used by countries of GCC, Pakistan, Malaysia and Turkey. Among countries of issue from non-Muslim world are the United Kingdom, USA, Germany and Hong Kong. For example, in 2009 GE Capital issued USD 500 mln ijara sukuk with 3.875% coupon rate and tenor of 5 years. In 2014 UK sovereign sukuk were issued with the size of GBP 200 mln, coupon 2.036% and tenor 5 years.

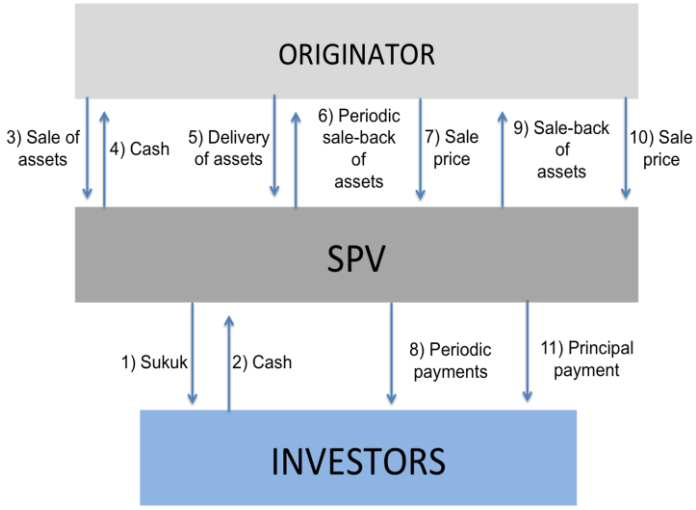
Salam sukuk involve a sale contract between two parties with immediate payment and deferred delivery terms. The purchase price of the assets is often called the salam capital and is paid at entering the salam contract, delivery of them is deferred until a pre-specified future date. A salam contract may be referred as an alternative to a forward sale contract. However, forward sale contracts are forbidden under Shariah law, since the element of uncertainty inherent in such contracts is eliminated.

Although the characteristics of salam structure may be straightforward adapted to the use as an underlying platform for sukuk, its' use is rare in comparison to some preferable structures like ijara sukuk. The limited use of this structure can be attributed to the limited number of certain standardized assets that are allowed to be used in salam structure. In scarce number of cases, salam sukuk are utilised by some institutions for short-term liquidity purposes.

The example of salam sukuk structure is presented below.

Figure 5.

Structure of salam sukuk



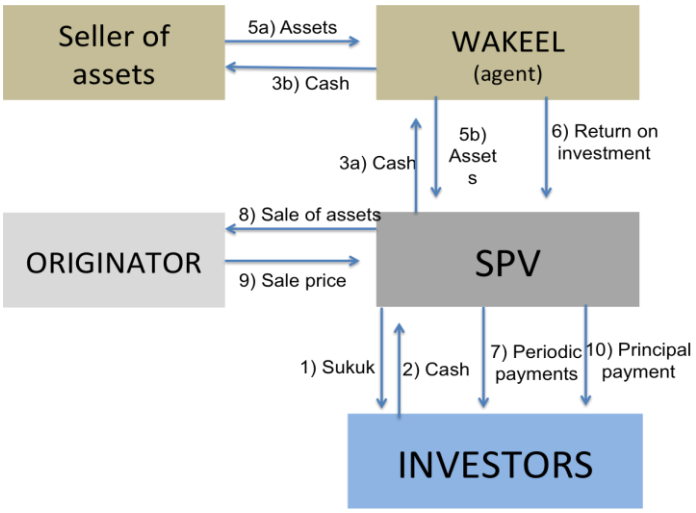
As at date of this paper, no salam sukuk issuance has been presented in Sukuk.com Database.

Wakala sukuk is referred as agency agreement, where investors appoint an agent (may be the same entity as originator) to invest funds provided in a pool of assets and apply her knowledge to manage it generating a certain return. In cases, where originator possesses assets, supporting sukuk, she may also be an agent, which resembles mudaraba sukuk. Unlike mudaraba, in which profit is distributed between borrower and lender according to certain ratio, a holder of wakala sukuk will receive only an agreed upon return, while the excess of return will flow to the agent as a performance or an incentive fee.

An example of wakala sukuk structure is set out below.

Figure 6.

Structure of wakala sukuk



In September 2014, Goldman Sachs announced an issuance of wakala sukuk worth $500 million with a five-year maturity, thereby becoming the second global financial institution (after

HSBC's Middle Eastern Unit), which issued sukuk. Roadshows conducted in Gulf countries showed that the issue is mainly oriented to investors from Qatar and the United Arab Emirates. Goldman has an extensive network of branches in the Middle East and Asia (17 offices), which increases the demand for diversification of funding sources and expansion of the product line. The rapid growth of the economies of the Arab countries raises the task of the bank to deepen its' experience in the field of Islamic finance. Nevertheless, Islamic financial experts are skeptical about the procedure, stating that an allocation of accumulated funds to finance operations prohibited by Shariah is present.

Wakala becomes the main structure for selection by major global banks: HSBC already experienced it in 2011, Bank of Tokyo-Mitsubishi UFJ, Japan's largest lender, issued this bond in Malaysia in 2014. Societe Generale sukuk project is launched on May 2016.

1.2. Analysis of sukuk risks

Since sukuk are securitized structures, they also provide a framework for the risk management. As sukuk are asset-based instruments, research in this regard also provides a framework for assessing and managing risk as well as addressing the legal and regulatory issues involved in SPV creation, assets purchasing and cash payments vehicle. These considerations form the basis of the research in evaluating the operating mode of sukuk structures and the underlying risks of each step of mechanism.

Risks of sukuk financing are considered mostly by Khan and Habib (2001). There might be defined risks that affect the profitability of Islamic financial instruments:

- Price risk;
- Interest rate risk;
- Credit and counterparty risks;
- Liquidity risk;
- Foreign exchange rate risk;
- Settlement risk;
- Shariah compliance risk.

Price risk

Price risk relates to price volatility of underlying commodities and assets and, thus, is a unique risk of Islamic bonds. Ijara sukuk are considered as the most exposed to this risk, as the value of assets may depreciate fast. Maintenance of assets will also influence this process. The decline of asset price may also impose some additional risks, such as coupon payment risk and asset redemption risk. The former describes a situation where asset does not generate enough profit and obligor fails to pay coupons on time. The asset redemption risk refers to cases when

due to asset price volatility borrower cannot repurchase it at maturity of sukuk. In sukuk structures, the principal amount paid may not be equal to the sukuk issue, since it should indicate a real value of underlying assets. As a result, there is a probability that assets will not be fully redeemed.

Interest rate risk

Despite their non-interest nature, sukuk certificates are said to be exposed to interest rate risk through the benchmarking to LIBOR. This link implies the probability an increase of LIBOR in future will make sukuk profit lower comparatively to future market conditions. However, the connection between LIBOR and sukuk has not been empirically tested yet, only descriptive research on matter is present. Consequently, there is no evidence of sukuk exposure to interest rate risk. The Chapter 2 of this paper is aimed to provide an empirical study of interconnection between sukuk price and LIBOR. The result of such analysis will lead to answer whether sukuk are exposed to interest rate risk which is associated with traditional bonds or not.

Credit and counterparty risks

Credit risk which refers to the probability that an asset becomes irrecoverable due to a default or delay in settlements. Each prospectus has provisions that take into account the termination of the certificate in the event of a borrower's bankruptcy. If the debtor is unable to fulfill her obligations to pay coupon payments, an owner of security is entitled to cancel contract and demand from the issuer to redeem assets back. In addition, if the principal amount of the debt cannot be repaid, investor can take an opportunity to apply to the court to start the procedure for debt restructuring. Fixed rate sukuk are more exposed to credit risk.

Counterparty risk is the probability that one of the parties retracts on the conditions of the contract. When a deal involves a contractual agreement than the counterparty risk is present. Unlike conventional financial institutions, Islamic banks do not have access to derivative instruments and other credit risk management tools, due to Shariah prohibition. Chapra and Khan (2000) and Khan and Ahmed (2001) highlight several credit risks sukuk are uniquely exposed to. For example, since the rescheduling of debt at a higher rate does not take place in Islamic finance due to the prohibition of interest, counterparties may be more inclined to default on their commitments. In case of salam sukuk, counterparty risk refers to that commodities will not be supplied on time or to the agreed quantity.

Liquidity risk

There two types of liquidity risks associated with Islamic bonds. The first one renders to sukuk investor. There currently does not exist a sufficiently liquid secondary market for sukuk as it is present for traditional bonds. Poor secondary market does not allow the investor to liquidate her assets as efficiently as possible. For this reason, most sukuk tend to be held until maturity.

This risk is also tied to informational inefficiencies and the number of market agents.

The second type of liquidity risk exposes sukuk issuer. In this case, it is related to liquidity deficit resulted in lags between payments to investors and returns from underlying assets. For the purpose of easing out such lags, issuers create liquidity facilities that accumulate funds in case of surplus after the distribution of coupon payments for future imbursements. Such facilities are mostly used for sukuk offering floating rate payments when interest rate differentiations are frequently present.

Foreign exchange rate risk

Foreign exchange rate risk presents unfavorable fluctuations in currency exchange rates. Exposure of sukuk by this risk is the same as of conventional bonds. Mainly, there is also no differences in FX risk for various types of sukuk. However, the liquidity and tenor of sukuk influence FX risk. For example, sukuk, which are liquid or which are relatively short-term in nature are less exposed. Exposure to exchange rates increases the risks for sukuk, which receive profits from underlying projects or commodities in domestic currency, while are denominated in U.S. dollars. Thus, the composition of assets in the pool has a contribution to the FX risk in different ways. Hence, it is advised to diversify the pool of underlying assets in different currencies in order to reduce foreign exchange risk.

Settlement risk

The concept of settlement risk is associated with SPV, since an issuer will be required to send payments through an intermediary. Mechanism of operations with sukuk bonds and inclusion of several contract parties in it provide fixed payments similar to traditional securities, avoiding at the same time prohibitions of Islamic law. However, it involves rare to Western issuers' bonds price risk, which relates to the prices of the underlying commodities and assets in relation to the market prices. There is a probability of devaluation of underlying assets upon redemption and possible loss of the underlying asset. In such cases, takaful insurance mechanisms are used, and a Special Purpose Vehicle (SPV) as an organization set up by the initiator for implementation of a specific project takes responsibility for servicing the asset structure. The losses of lenders will be reimbursed with the help of a clearing center. This scheme is similar to the financing of mudaraba, where bank acts not only as a mechanism for attracting and placing funds, but also takes all costs in case of unprofitability of the project. Ijara sukuk are most exposed to this as the values of the underlying assets may depreciate faster as compared to market prices, but the structure of this bond offers fixed coupons. Maintenance of the assets will play an important part in this process. Liquidity of the sukuk assets also plays an important part of risk determination.

Shariah compliance risk

Any extension of financial instruments in an Islamic framework will invariably imply Shariah compliance risk. To reduce it a discussion of the Shariah legal requirements is necessary. Some studies examine the nature and application of sukuk structuring techniques, with an emphasis on legal considerations (McMillen, 2007), accounting regulatory issues (Rahman, 2003) and governing legislation techniques in a sukuk prospectus (Oseni & Hassan, 2015). The essence of the literature suggests that to ensure the benefits of integration of the Islamic finance with the Western markets, there must be Shariah-compliant transactions in Western jurisdictions. This means that a new framework for governing sukuk issuance with respect to Shariah law should be developed. Moreover, investments in sukuk give rise to a number of accounting and reporting issues related to accounting recognition, measurement, and disclosure. For example, agents may require more transparency from Islamic institutions as they bear more risks by investing in sukuk. A sound accounting and reporting standard for Islamic financial instruments is the main requirement for a well-regulated Islamic financial market that meet the requirements of Shariah-compliant and market practicality.

The work of the Accounting and Auditing Organization for Islamic Financial Institutions (AAOIFI, 2002) provides premises for possible testing of such financial instruments to conform to the relevant legal requirements. Further Islamic cross-country banking research could examine the statutory compliance of Islamic products with the Basel Accord and other regulatory matters (Karim, 2008). Saeed and Salah (2014) argue that an imbalance is created in the sukuk market between an idealistic approach to sukuk structures and the pragmatic approach that has been adopted by many sukuk practitioners. It is most likely that, in practice, a combination of these two approaches will be used to develop the sukuk market. It leads us to conclusion that although Islamic financial markets are revolutionary in their nature, some legal changes should be done to develop them globally.

The study of Ali Said and Rihab Grassa (2013) shows that a regulatory quality has a significant effect on the development of sukuk market. This implies that countries ranking higher in regulation quality have a larger sukuk market. This can be interpreted as efficiency and reliability of regulations. Furthermore, countries adopting a Shariah legal origin and mixed common Shariah law legal origin has a developed sukuk market. This outcome can be explained by the fact that Shariah law is the principles source of Islamic finance, hence government adopting Shariah legal system are more interested to develop the Islamic finance industry. This result underpins that legal regulatory processes become the main obstacle of the development of Islamic finance.

Such works are important, since they help to make recommendations provided in our paper more applicable in real world from statutory viewpoint. Our conclusions concerning implications of bonds are advisable and cannot guarantee an approval in Muslim legislation system.

Our analysis of risks is a review of existing studies, unfortunately, none of described risks accept legal risk was tested empirically. The Chapter 2 of the study is aimed to investigate, for the first time in existing literature in matter, what risks are associated to real sukuk issuances.

1.3. Analysis of sukuk pricing

A common question when considering a development of sukuk is that how they should be priced. It is obvious that more research on sukuk is needed to identify factors affecting its' pricing and performance of various structures. An understanding of sukuk impact on market functioning with respect to economic development and social welfare is essential. Although the process of issuing sukuk is similar to that for conventional bonds, the former represents a different type of instruments, opposing traditional bonds. Thus, they need a newly developed approach for their pricing. The evidence also shows that there is difference in price behavior. The nature of this bond assumes that the reward to investors is conditional on profits occurring, thus the payment is not fixed. However, to apply valuation model developed for fixed coupon paying bonds, we need to treat pay-offs specified in sukuk as fixed. Thus, a contract based on leasing payments should be considered because it allows rewards to be fixed and paid periodically.

In theoretical terms fixed annual interest rate payouts to investors over the life of the conventional bond are not used for sukuk bonds. Instead, sukuk returns are derived from leases, profit or sales of assets such as property, equipment or joint venture business. In practice, the pricing is more complex and not limited to the value of underlying assets only. The challenges in price setting include the absence of a universal Islamic bechmark rate and a mechanism for price updating, the small number of participants and, more fundamentally, no consensus regarding the types of activities or investments that bonds can be underwritten on.

We provide several fundamental studies on pricing of sukuk with fixed coupon (ijara sukuk). It can be said that the papers described further are the only works devoted to the matter of Islamic bonds' pricing. However, even in this limited number of studies no concrete formula of ijara sukuk pricing is provided, which highlights the research gap in the sukuk sphere.

First is the main descriptive study on the question of sukuk valuation. It is written by Safari, Ariff and Mohamad. In their book 'Sukuk Securities: New Ways of Debt Contracting', authors propose four methods, applicable in the case of sukuk securities. They state that

described mechanisms may be used in the valuation of sukuk, since, according to study, all these methods are simultaneously in line with the ethical and religious requirements of Islam and do not make any conflicts between the concepts, general procedures, and rationality of these methods. Although, in the research it is suggested that some adjustments to the current market conditions should be done, no example of mentioned calibrations is provided. As a valuation of cash flows generated from underlying assets, academics propose using conventional bonds pricing methods, that do not contradict with principles of Islamic markets.

The principles of Islamic finance lay in the foundation of the Islamic instruments pricing, and then all possible patterns of cash flow generating and payments of different structures are created based on their definitions. Sukuk securities that provide identical cash flow patterns as conventional bonds may be, theoretically, priced with the similar models. For instance, ijara sukuk (a lease contract) authors compare with coupon-paying collateralized bonds, so their price should be computed in the same manner. Thus, in order to develop accurate valuation techniques and to make them more understandable for practitioners, Safari, Ariff and Mohamad selected conventional pricing approaches as principal for calculation to arrive at sukuk theoretical prices.

The first method of valuation is a demonstration of a basic economic concept of supply and demand. It suggests that the price would be an indicating value in which the market supply and demand for a product meets the funds available. In another way, it is referred as the public auction pricing process.In this process, the obligator, with the intermediary services provided by an investment bank, structures a proposal for an issuance of sukuk. Through the public auction (road show) held by the investment bank, the initial price is discovered by the investors through the bidding process. Investors bid for the highest price if they assume that the bond possesses such value for them. Therefore, the sukuk would be sold to the investors, who proposed the highest bids. This method is widely used by practitioners for valuation of publicly traded sukuk securities, which is also similar for conventional bonds.

The second method considered in the mentioned book represents a process of a private negotiation. This method refers to over-the-counter market, where issue is offered not to public, but rather to a limited number of private investors. This process was developed within investment banking sphere. The main purpose of it is to cut a deal between the originator and the investors. Another way, this deal can be conducted without any intermediaries as a direct bilateral negotiated contract between two parties. This method also reminds the similar type of contract used in a bank loan between a lender and a borrower. However, in case of Islamic regulations, these bilateral agreements are enforceable legal documents governing the prespecified contract terms between the originator and the investors.

The third method of pricing is called a convertible pricing. The name refers to the feature of some sukuk that have a convertible option embedded in their structure (e.g., Telekom Malaysia). Such debt obligations provide their investors with the option to convert their sukuk certificates in a certain amount of equity shares of the firm originator after a prespecified time. Sukuk bonds issued in markets of London, Dublin, Berlin, and Luxembourg are originated by firms listed in their local markets.

There are two special elements that might be highlighted in such structures. First, the value of a bond is tied to the price of an equity share, it can be converted in, because of the options featured in them. Second, the underlying equity stock value represents a cross-market firm. Such placements therefore have the same features as the depository receipts of a foreign company's stock in the market where the sukuk securities are traded. Thus, known mechanisms of pricing depository receipts may be used in sukuk valuation. Such forms of sukuk securities have, at the moment, a small share of the market. However, authors see a potential growth for this type of funding structure.

The first three pricing methods consider the market value of the security, since they are mostly laid on the outcomes of initiatives, driven by market, such as supply and demand forces. However, when conventional fixed-income securities are actually priced, the methods used are not limited to market.

The market-driven pricing methods became useful, as there is no a theoretical pricing model, which is the fourth method applied for conventional debt securities valuation. The absence of such model leads to the fact that the underlying value of the bonds are partly overlooked. The lack of correct measures causes the mispricing commonly observed in the sukuk security market.

We believe that a more accurate price for sukuk will be resulted in the combination of the two categories of methods described above, market based and theory based. Although, authors of the descriptive study ('Sukuk Securities: New Ways of Debt Contracting') convince that prices of sukuk with fixed coupon can be obtained with conventional pricing methods, we suppose that the principles of Shariah-compliant bonds imply price drivers, which are different from those for traditional bonds. To find unique factors affecting sukuk prices is the main goal of our research, which underpins the need to develop a pricing methodology, specifically for sukuk bonds.

Existing empirical researches on matter of pricing methodology consider ijara sukuk as an object for construction a financial model. Mainly, for four reasons: 1) it is the most popular structure of sukuk currently on markets; 2) it is widely used among Western enterprises and financial institutions as an alternative source of funding; 3) it offers fixed coupon, which allows to draw a parallel between ijara sukuk and conventional bond; 4) ijara sukuk prospectuses are

available and information concerning release is public. Thus, access to data on issuances allow us to analyze bonds prices.

Musharaka sukuk (profit and loss sharing), for example, has no alternative among conventional bonds because its payoff represents the performance of the underlying project in a partnership. Thus, the cash flows are not predetermined, and modeling the security would be more challenging and would be by the nature closer to the pricing of equity shares.

The only empirical study on matter of sukuk pricing was developed by N. Naifar and S. Mseddi (2013). The difference this paper purports to make in the literature is to provide pricing methodology for ijara sukuk, exploring empirically the determinants of sukuk yield premium by using equity market variables and macroeconomic variables. We found that this paper is the first study that examines empirically the determinants of sukuk spreads. Model showed that a positive slope of yield curve for the market where sukuk were issued is associated with an increase of sukuk yield spread. Authors consider slope of the yield curve, which was calculated as the difference between ten-year and three-month treasury rates, as a good predictor for future economic activity. Furthermore, study showed that sukuk yield spreads react positively to higher stock index returns. In this way, the findings of Naifar and Mseddi could affect the investment decisions as slope of yield curve indicated expectations about future inflation, which can be interpreted as an increase in sukuk future prices.

Since, analysis was based on ijara sukuk with real estate property as underlying assets, a fundamental part of the pricing framework is the estimation of term structure of rental property, default probabilities, discount function and recovery rate. However, more research on this is needed to compare market prices against fair value prices.

Although, the paper makes a good analysis of relationship between sukuk and different macroeconomic variables, it does not consider the factors that are specifically linked to sukuk prices. The analysis presented in the paper assumes that payments of all ijara sukuk issuances are made from rental property, however the effect of the underlying asset on ijara sukuk price was not examined. Moreover, the empirical test of the model with real data is needed.

As for agencies that offer sukuk valuation services, we may highlight Bond Pricing Agency of Malaysia (BPAM). It insists that Islamic and conventional bonds are fundamentally different in both structure and, thus, valuation techniques. Among Islamic features that are unaccounted in current market valuation it mentions inclusion of underlying asset volatility, term structure of asset, prepayment and counterparty risks modeling. Additionally, since bond's structure includes unconditional and irrecoverable purchase of assets at maturity, it requires forward pricing of assets, for which forward benchmark rate is needed.

BPAM considers asset pricing as a central part of sukuk valuation. Key challenge in this part may be determining from bond prospectus, what property was set as an underlying asset, data aggregation on specific asset classes and using this information in pricing models.

1.4. Factors of sukuk price

In the previous paragraph, we considered different analyses of sukuk pricing. However, as it may be seen, there is no unified pricing model for any of sukuk structures. Moreover, no sukuk valuation formula is developed. However, the coverage of this question in academic studies allow us to define factors, that, in theory, may have an influence on sukuk price. We present indicators that can, further, be used in our empirical analysis presented in Chapter 2. The main factors that are may have impact on sukuk price are as follows:

- Price of underlying asset;
- LIBOR;
- Macroeconomic factors (GDP, CPI);
- Corporate performance of an issuer;
- Interest rate of a country of issue;

To provide a theoretical basis for our empirical analysis and to select explanatory variables for our model, we consider more deeply each factor.

Price of underlying asset

We believe that an underlying asset is the principle variable in pricing of all types of sukuk. The innovative nature of sukuk lays upon its' contribution to the real economy with all cash flows derived from assets. We assume that all types of sukuk, even those that offer fixed coupon (e.g., ijara sukuk), are exposed by assets' prices for several reasons.

Firstly, the definition of sukuk implies that these instruments grant the investor a share of an asset. For this reason, sukuk are often opposed to conventional bonds, which confer an ownership of debt. In some cases, several types of sukuk are classified closer to equity than debt.

Secondly, sukuk holders bear any risk associated with underlying assets and must assume any losses in case of their impairment. Risk sharing is one of the requirements of earning profits, permitted in Islam. Receiving a share of income generated by an investment financed by a sukuk holder, without taking responsibility for its outcome, is inconsistent with the Muslim ethics. Since investors do not introduce their efforts to the project, then in order income to be earned, they need at least take risk. As co-owners of productive assets, sukuk holders face the risks of ownership. In particular, they face the risk that their assets may not generate sufficient profits or that may even incur losses. They also face the risk that the assets may be damaged or destroyed completely, which also implies a cost of insurance paid by lenders. As for ijara sukuk, where in

most of cases property such as building acts as an underlying asset, it is proposed to consider also the cost of maintenance and damage to real estate in order to compute the expected price of bond.

Thirdly, cash flows incremented to investors are generated only from one source, which is usage of underlying assets. Because income is generated by trading or real investment rather than lending, sukuk holders earn profit rather than interest.

Finally, the structure of sukuk is embedded with a binding promise from the borrower to repurchase the assets at maturity as a repayment of the principal amount of a bond. In this structure, the sukuk holders can only require the originator to purchase the underlying assets. To comply with the Shariah the refund is accomplished by requiring originators to repurchase the underlying assets from investors on an agreed-upon date. In some cases, capital guarantee is embedded in sukuk structures. This means that the price at which the assets were repurchased is identical to the price at which they were first sold to the investors. This effect of returning to investors exactly the same amount they invested was introduced in order to increase demand for sukuk. However, regardless of the presence of capital guarantee, holders are exposed to the price risk of underlying asset till the repayment of the whole loan.

LIBOR

In the literature, it is stated that sukuk price depend on conventional market benchmark rate, London Interbank Offered Rate (LIBOR). However, it is undesirable under Shariah law because it is an interest-based rate. For this reason, there are ongoing disputes among issuers regarding an absence of Islamic benchmark rate. Currently, most of studies, which observe sukuk pricing mechanisms, consider LIBOR as the most common benchmark adopted in determining price or rental-based return on bond. Views of academics on issue are split into three parties: 1) those, who see it permissible; 2) those, who support a development of an innovative Islamic benchmark; 3) those, who propose already existing indices as a benchmark for sukuk.

The first group of scholars address attention to the understanding of permissibility of employing of interest-based index for Shariah compliant products and transactions. They notice that the major element that differentiates legitimate profit and prohibited interest is a secured gain that is associated with transactions primarily without involvement of any underlying assets. It means that the profit earned should always be associated with risk and exposure to uncertainty. Thus, tightening Islamic financial instrument with any conventional interest-based index will not be impermissible. Any income associated will bear risk and uncertainty, i.e. will be completely Shariah-compliant. If the return is not self-generated, it is permitted regardless its' equality with other financial return. And, on the other side, if the return is self-generated, even its'

independency from conventional benchmarks will not make it allowed. However, any involvement of such indices will reflect dependency on such benchmarks that subsequently creates misunderstanding.

According to Usmani (2008), using interest rate as a benchmark for determining profit of sukuk does not render the transaction to be invalid or prohibited, as it does not contain the interest itself. LIBOR is used only as an indicator or a benchmark. Safdar Alam, head of Islamic structuring at JPMorgan, stated that it is difficult to move away from LIBOR benchmarking, because Islamic finance operates as a sub-sector of conventional banking and money system, which has to use this rate to price any deferred cash flows, adding appropriate spread.

The second group of academics highlight the necessity of a unique Shariah-compliant benchmark. They criticized the point of former as it is difficult to distinguish, whether transaction uses LIBOR only as a benchmark or it is exposed by interest-based indicator, which contradicts the core principle of Islamic finance. Although, Islamic money market and capital market products are technically structured as they have asset-related cash flows, this cannot be named truly progressive as long as the pricing of such cash flows is still benchmarked to LIBOR. So even though a product like sukuk may technically be Shariah-compliant, it is also needed to accept such product as it is does not enforce a moving away from a LIBOR benchmark to one that is related to profitable real-economic activities that resource mobilization results in. The first step, suggested by experts, towards improving of current state is for market agents to work in alliance and agree on a collective plan upon development of a benchmark or a set of benchmarks, based on belief-compliant criteria. It would be a complex process, since balance sheet of Islamic financial institutions are comprised of assets and liabilities linked to LIBOR-benchmark. Until the industry will not have agreement in taking this step, Islamic finance will be seen as just another with impressive values but failure to convert those values in real developments align with true adherence to the principles of Shariah.

The development of an alternative benchmark will present the ideally independent picture of Islamic finance. This requires all agents to create a consensus that they all will borrow and lend among themselves only, unless the funds are insufficient or entirely unavailable. Moreover, all calculation, forecasting and projection should be quoted on market as an independent index (can be referred as Islamic Interbank Offer Rate). Ehsan Waquar, member of Shariah Committee at Emirates Global Islamic Bank, suggests addition of new participants and inclusion of new instruments offered on the Islamic markets will diversify, enrich and gradually improve such index with time. This measure will finally lead to a mature independent Islamic index, which represent an audacity and innovation of the entire system. However, instantly the question is risen whether such independency will not be an obstacle towards the extension of Islamic

financial services on markets of Europe and the U.S. Moreover, it should be compromised what currency to use in calculation of Islamic index, since most of sukuk are denominated in U.S. dollars and interest rate of major issuers are provided in local currencies.

The third group of scholars propose already existing indices as a benchmark for sukuk pricing. For example, Sh. Faizal Manjoo, lecturer in Islamic Law & Finance, proposes a rent index as an appropriate benchmark for ijara sukuk, as this structure is attributed to rental payments. Some of the studies suggest that alternative benchmarks to LIBOR can be adopted and linked based on macroeconomic indicators of real activity (i.e., GDP growth) for sovereign sukuk and firm performance for corporate sukuk. These issues are considered in detail, further.

Macroeconomic factors

It is also stated among the principles of Islamic bonds, as for them to be financially innovative it is essential that sukuk pricing is based on real macroeconomic factors (at least, for sovereign issues) rather than on interest based benchmark (Wilson, 2008). GDP influence on sukuk price can be explained through a positive relationship between economic growth and government's tax income (especially, for countries with taxes on income and sales). Further, higher tax revenue increases capacity of a state issuer to pay higher return to bond holders (Tariq, 2004). This lies along with a sukuk concept of risk-sharing. By relating remuneration of investors, to the performance of the state economy, sukuk holders take on some sovereign risk.

It is also important to decide which macroeconomic variables can have an influence on price of sukuk. As for indicators of economic growth to be taken, academics suggest taking GDP growth for Malaysia, Indonesia, European countries and the USA. For GCC a stable indicator of economic growth might be non-oil GDP, given the volatility on international oil markets. In literature, it is assumed that fixed income securities will, anyway, be exposed by influence of interest rates. However, in the case, of benchmarking a bond with GDP growth, expectation about the performance of economy will also affect pricing.

Many studies consider macroeconomic factors as drivers for overall growth of sukuk market, however their role in pricing of a particular issuance is not observed. Some of the studies suggest that alternative benchmarks to LIBOR can be adopted and linked based on macroeconomic indicators of real activity (i.e., GDP growth, CPI) for sovereign sukuk and firm performance for corporate sukuk. Said and Grassa (2013) investigate similar issues on the determinants of sukuk market development in ten countries. The results show macroeconomic factors (GDP per capita, Muslim population, economic size, trade size) have a positive impact on the development of a sukuk market. The link between sukuk prices and real economic variable will be a proof that Islamic financial institutions earn money not on interest, but on real economic indicators, as it is stated in their goal.

The study of Ali Said and Rihab Grassa (2013) investigates on the determinants of the development of the sukuk market for the period 2003-2012. Overall, the results show that a confluence of many variables drives the development of sukuk market. Macroeconomic factors such GDP per capita, economic size, have a positive impact of the growing of the sukuk market, trade openness has also a positive effect. This implies that higher level of natural openness results in the higher level of access to external funding and, thus, the greater the development of the local sukuk market. The financial crisis has a significant negative effect on the development of the sukuk market since the amount of sukuk issued in those years has declined considerably. It also implies that Western markets and markets of Islamic counties are intercorrelated. However, the Dubai debt crisis has no significant effect on the development of sukuk market. Furthermore, traditional bond market has a significant and positive impact on the development of sukuk market. Thus, it appears that conventional bond market and sukuk market are complements rather than substitutes. Finally, the percentage of Muslim has a positive effect on the development of Sukuk market, which is also expected.

Corporate performance of an issuer

Despite that sukuk are defined as a share in asset rather than debt obligation, it is still considered among scholars to be dependent on the business performance of a borrower. Rodney Wilson (2008) suggests that corporate sukuk may be benchmarked against the performance of the issuing company. Since there is a dramatic difference between equity investments and debt obligation, it is not proposed to compare sukuk with company's shares. However, according to author, the use of amount of paid out dividends or profitability indicators would be entirely appropriate as a basis for analysis of the type of sukuk based on musharaka and mudaraba partnership structures, since these contracts involve sharing of profit or loss gained from a particular project, which is implemented by the company and financed with sukuk.

In his paper, Rodney Wilson suggested another possible implication of indicators of corporate performance in development of pricing methodology. It might be mudaraba based corporate sukuk, with investors sharing in the earnings of the company, but not in the losses. With mudaraba sukuk the return would be lower than with musharaka sukuk, but companies would be expected to make some provisions in highly profitable years so that payouts could be maintained in less profitable or loss making years. Thus, bond holders pay for flexibility of investment. Shariah boards have authorized this practice for investment mudaraba deposits with Islamic banks. For investors, the returns profile would be smoother for mudaraba sukuk than for their musharaka equivalent, but the expectation would be for higher returns on average to compensate for the greater risk involved. Thus, financial performance of the company can be a reason for the choice of either of two profit-loss sharing sukuk structures.

Thus, indicators of business performance can be included in the pricing models for types of sukuk structures, mentioned by the researcher. Mainly, author proposes types of sukuk that do not offer fixed coupon payments. Unfortunately, mudaraba and musharaka sukuk are hardly applicable for comparison with conventional bonds, and, therefore, are hardly applicable to our study.

Interest rate of a country of issue

We have already considered exposure of sukuk by interest rate in analysis of risks of Islamic bonds. Generally, sukuk based on fixed rates (ijara, salam) are exposed to interest rate, as conventional fixed rate bonds are exposed to it. The rise in market (interest) rates leads to the fall in the fixed-income sukuk values.

A fundamental principle of bond investing is that market interest rates and bond prices generally move in opposite directions. When market interest rates rise, prices of fixed-rate bonds fall, which is known as interest rate risk. Interest rate risk is a common of all bonds and is included in their pricing. A bond's maturity and coupon rate generally affect how much its price will change as a result of changes in market interest rates. If two bonds offer different coupon rates while all of their other characteristics (e.g., maturity and credit quality) are the same, the bond with the lower coupon rate generally will experience a greater decrease in value as market interest rates rise. Although sukuk bonds are considered to be exposed by interest rate risk, we believe that there is no research that can show en evidence on that.

Generally, data availability imposed limitations on our research. Compared to the literature on conventional bonds, the existing research on sukuk is relatively scarce, mostly consisting of qualitative rather than quantitative work in the form of descriptive research, regulatory and conference papers. Most of the research on sukuk is theoretical studies and focuses mainly on explaining and developing sukuk structures with an emphasis on legal considerations. In the recent years, some empirical studies are devoted either to research on structured sukuk instruments with case studies or to study the relation between stock market conditions and sukuk behavior. The underdeveloped literature on sukuk can be attributed mainly to a lack of available historical, consistent, and reliable data regarding pricing dynamics of particular issuances.

The bulk of the literature focuses on operational matters of sukuk issuance and structure in practice, which revolve around their need to be Shariah-compliant. Limited literature has undertaken study on methodological aspects of sukuk pricing, followed by empirical research, and no studies examine recent issuances of sukuk to observe its' implications in conditions of the real economy. New research should provide a new practical framework on sukuk and for sukuk practices that do not merely replicate existing practices for conventional bonds, but rather modify them and develop new frameworks specifically adjusted to Islamic products.

Summary

The detailed investigation of sukuk structures allows us to understand the potential ways of their development and possible challenges. The first chapter we started by highlighting main principles of sukuk instruments such as prohibition of interest, risk-sharing and ownership of assets, which distinguish sukuk from other bonds. We described main types of Islamic bonds and mentioned that, currently, ijara sukuk certificate prevails on markets because of its' clear structure and resemblance of conventional bonds.

We provided information on sukuk risks, which include unique both Shariah-compliant finance risks and those, that are also associated with traditional instruments. However, the analysis of risks showed that there is no empirical testing of mentioned risks.

The thorough investigation of sukuk pricing allowed us to outline factors that can be used for our econometric analysis. However, the study of previous research on sukuk pricing revealed the absence of a unified methodology, moreover no formula of sukuk valuation is presented in existing papers. Most of the papers propose factors that by influencing sukuk prices distinguish this type of debt obligation from a conventional one. However, none of the mentioned factors was empirically tested on its' relationship with sukuk prices.

The main problem found is that there is no investigation regarding relationship of sukuk with factors such as underlying asset, conventional bonds, interest rate. Such analysis may empirically test the alignment of current sukuk issuances with the initial principles of Shariah-compliance. Moreover, the uniqueness of sukuk certificates requires a development of recommendations for investors, which has not been provided yet. In literature, sukuk are considered as an alternative source of funding, for this reason, benefits and challenges of investing in sukuk should be analyzed.

CHAPTER 2 – EMPIRICAL RESEARCH OF FACTORS OF SUKUK PRICE

2.1. Methodology

The main method of our study is regression analysis. In order to test the stated hypotheses regression models are built in the research. All of them are aimed to investigate factors, which influence the price of sukuk. We selected three originators of sukuk issuances: 1) government; 2) company; 3) state agency. Then, for each of them we built a regression model, which includes factors related to an originator of bonds.

All regression models have the same basic model as following:

$P_{sukuk_{t,i}} = \alpha + \beta_1 * P_{conv_{t,i}} + \beta_2 * LIBOR_t + \beta_3 * P_{asset_t} + \varepsilon$, where

- $P_{sukuk_{t,i}}$ – price of sukuk for time period t, issued by originator i,
- $P_{conv_{t,i}}$ – price of conventional bond for time period t, issued by originator i,
- $LIBOR_t$ – value of LIBOR for time period t,
- P_{asset_t} – price of an asset, underlying sukuk, for time period t,
- $\beta_1, \beta_2, \beta_3$ – vectors of unknown coefficients,
- ε – random variable.

The dependent variable – is the price of sukuk bond, traded currently on the market. In our regression model, we used clean prices for sukuk, since their values are available in open sources. A clean price is commonly used for price tracking and reflects the value of the bond within the current marketplace.

Generally, a clean price is calculated as discounted future cash flows, not including an interest accruing till the next coupon payment date. The common formula for clean price is presented below.

$P_{clean} = c * F * \frac{1-(1+r)^{-t}}{r}$, where

- c – coupon rate on the bond,
- t – time periods over the term of the bond,
- F – face value of the bond,
- r – interest rate prevailing in the market.

Since we determined the dependent variable, we now describe explanatory variables we

use in our analysis. In particular, we discuss, what they represent, why we think it is relevant to include them in the regression model and which relationship we expect them to present with the dependent variable.

Prices of underlying asset (Stata: *asset*)

As sukuk bonds are, according to Shariah principles, considered to be based on market prices of underlying assets, we assume that the latter have a direct impact on the price of a bond. Moreover, cash flows (coupons) to lenders represent rental payments on such assets. However, since no empirical research was done on that, the financial innovation of sukuk becomes questionable. As there is no link between asset price and price for Islamic bond is found, investors will hardly believe in their distinctive nature. Our study is aimed to fill this research gap.

The coupon paid to investor is generated from the usage of an asset, the face value of bond is paid from realization of the asset at maturity. For this reason, we expect the positive relationship between the price of underlying asset and dependent variable.

Prices of conventional bond, issued by sukuk originators (Stata: *conv*)

In our research, we also set a hypothesis regarding a relationship between price of sukuk and price of conventional bond issued by the same company.

Firstly, academics mention an effect of company's performance indicators on sukuk prices. However, we do not consider a comparison between daily prices on sukuk and quarterly performance measurements of a business as an appropriate. Generally, conventional bond's prices are partially a result of company's credit rating, which represents the ability of a company to make interest payments and repay the principal on a bond. Thus, pricing dynamics of conventional bond are also an indicator of past financial results of company's activities or expectations about its' cash generating ability in the future.

Secondly, by taking conventional bond's prices as an explanatory variable in our analysis, we do not have to limit it to corporate issues, as it is suggested in the literature on this topic. A mix of conventional and sukuk bonds used as sources of funding we can find in both, sovereign and corporate portfolios. It makes our study less exposed to the problem of data availability.

Finally, to make results of our regression model reliable, it is essential to include factors, which are perfectly consistent in terms of comparison with our dependent variable. In this case, conventional bond's price is suitable for analysing it as a possible factor affecting sukuk price. Moreover, data on the matter were chosen with the preservation of similiraty of maturity structure and coupon rates on bonds, the same year of issuance and the same coupon payment frequency.

At the same time, conventional bond markets contribute positively to the development of the sukuk market. It appears that the conventional bond market and the sukuk market are complements rather than substitutes, since they reflect more sources of funding. Moreover, during crisis a diversified flow of financing is crucial for most of companies.

Based on the reasons stated, we expect a positive relationship between the dependent variable and prices of conventional bonds.

LIBOR (Stata: *libor*)

The phenomenon of the benchmarking of sukuk with market references such as LIBOR will be investigated in the light of Islamic finance requirements. Studies that explore the use of alternative benchmarks for sukuk pricing are rather contradictive because the market fails to address the criticism that sukuk pricing is linked to the LIBOR. Sukuk is considered as non-interest bond, hence its' link to rates from Western financial system is hardly acceptable. It also imposes risk to independence of Islamic financing modes from interest based economy. Although this topic is today very discussable on Islamic financial markets, there has been no research, which investigates the evidence that LIBOR interest rate influences sukuk pricing. Since, LIBOR is not permitted in Islamic financial system and no information regarding the nature of its' influence on sukuk prices is available, the expected relationship between LIBOR and the dependent variable is unclear.

2.2. Sample selection

My sample was constructed by searching Thomson Reuters Datastream for all the sukuk issuances, which fulfill the following conditions:

- Sukuk prices are available for the period from January 2014 (or a later date of issuance) to April 2017.
- Sukuk are denominated in US dollars.
- Originator of sukuk has issued conventional bonds with the same maturity as Islamic bonds.
- Originator has announced a type of underlying asset, sukuk is based on.

The first requirement is data availability, which imposed main restrictions on the analysis. Despite of rapid growth, sukuk markets are in their infancy and most of the trade is restricted to primary markets. In the few cases, where secondary market data is available, there was not enough time series as a mean for reaching a reasonable conclusion. The period of issuance from 2014 is used to, first, observe current trends on market, second, obtain sufficient number of values, third, observe sukuk price behavior during volatile period on oil markets and, fourth, not cover years of financial crisis, which can be outliers in our data. The

requirement that all variables should be denominated in US dollars and have daily frequency is justified by making all types of data, used in research, comparable with each other.

As for explanatory variables, initially, we wanted to include more factors in our analysis, however, after preliminary investigations we found that, first, there are data restrictions and, second, there is a problem of multicollinearity, which can make results of our regression model not reliable. For this reason, we developed the following criteria for selection decision.

- Data on variable is available for the period from January 2014 to April 2017.
- Frequency of variable data is daily.
- Data on variable is denominated in US dollars.
- Variable does not have significant correlation with other independent variables.

Finally, we selected three sukuk issuances, for which all variables fulfill our criteria.

- Sovereign sukuk of Malaysia,
- Petronas sukuk,
- Cagamas sukuk.

All originators have used conventional bonds with the same maturity as sukuk for financing their activities, and for all issuances data regarding the type of underlying asset is available. We use data for liquid sukuk because they are completely negotiable and can be traded in the secondary markets. Moreover, the presented selection of sukuk is diversified, since sovereign sukuk, corporate sukuk and sukuk of state agency are included.

2.3. Descriptive statistics of variables

Let us provide an overall summary of issuances that we selected for the empirical part of the study.

Table 2.

Summary of sukuk issuances characteristics

Issuer	*Issue date*	*Maturity date*	*Issue size*	*Coupon*	*Rating*	*Country*	*Currency*	*Structure*
Government of Malaysia	22.04.2015	22.04.2025	1 000 000 000	3,043%	A-	Malaysia	USD	wakala/ijara
Petronas Berhad	18.03.2015	18.03.2020	1 250 000 000	2,707%	A-	Malaysia	USD	wakala/ijara
Cagamas Berhad	10.03.2016	10.03.2017	1 000 000 000	2,30%	-	Malaysia	USD	ijara

As it can be inferred from the table, sukuk certificates in our research have different maturities, from short-term (1Y) to long-term (10Y). Issue size ranges from USD 1 bln to USD 1.25 bln. This figure is less than average bond issue size originated by major U.S. companies in

2015, which is USD 2-3 bln (Fitch, 2015). We can see that Malaysia remains the major developer of Islamic finance with the highest value of issuances of sukuk, since all issuances that fulfill our criteria and were selected for inclusion in econometric research are originated in this country. All sukuk have an ijara platform, which means that they provide fixed coupon rate and are comparable with conventional bonds.

Now we split descriptive statistics part into three subparts according to our regression models, where the dependent variable is the prices of: 1) sovereign sukuk of Malaysia; 2) Petronas sukuk; 3) Cagamas sukuk. Then, we provide a table with summarized statistics for all variables, dependent and independent, and analyze each of them deeper.

Regression 1. Sovereign sukuk of Malaysia

Malaysian sovereign sukuk were issued in 2015 with the maturity of 10 years. The prices obtained are for the period from 21.04.2015 and till the date of data retrieval on 08.02.2017, overall 468 observations. The following sukuk has prespecified fixed coupon payments of 3.043%. Deal has the value of USD 1,000,000,000 and was arranged by CIMB Investment Bank Berhad, HSBC, Standard Chartered Bank, Dubai Islamic Bank PJSC, National Bank of Abu Dhabi PJSC. Following issue has ratings S&P A-, Moody's A3. The proceeds received by the government of Malaysia from the sale of the assets will be used by the state for Shariah-compliant general purposes, specifically for the redemption of Malaysia Sukuk Global Berhad's USD 1,250,000,000 Trust Certificates due in June 2015 as well as to finance development expenditures.

Table 3.

Descriptive statistics of factors for Regression 1

Variable	*Obs.*	*Mean*	*Std.*	*Min*	*Max*
sukuk	468	99,25	1,95	95	102,75
conv	468	99,62	1,82	95,75	102,80
Libor	468	0,60	0,24	0,27	1,04
asset	468	49,57	8,54	29,49	68,80

1. Sukuk prices (Stata: *sukuk*)

As we can infer from the table sukuk prices in our sample range from USD 99.25 to USD 102.75 with the mean of USD 98.90.

2. Conventional bonds prices (Stata: *conv*)

Sovereign bonds of Malaysia were issued in 2015 with the date of maturity on 15.09.2025. Prices retrieved for these bonds are for the same period from 21.04.2015 to 08.02.2017. During the period selected, conventional bonds' prices range from USD 99.62 to

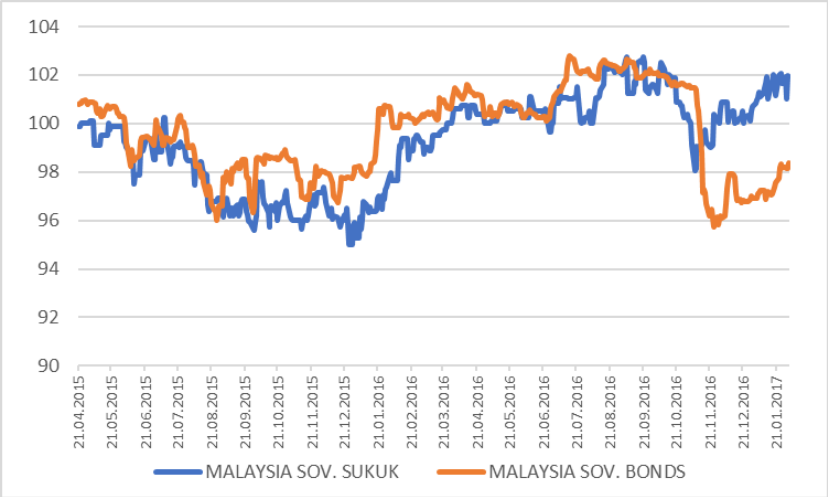
USD 102.80 with standard deviation of 1.82, which is less than for sukuk bonds.

As it was discussed in theoretical part, conventional bonds are a representation of overall credibility of the company. So, we assume that higher prices for bonds will be a signal for investors about company's performance and, then, will increase prices for sukuk. Hence, sukuk bonds are expected to have the same price pattern as conventional bonds with highs and lows occurring at the same moment, possibly with some time lag.

The graph below shows the dynamics of sukuk and conventional bonds of Malaysia.

Graph 3.

Dynamics of Malaysia sov. sukuk price and Malaysia sov. bonds price



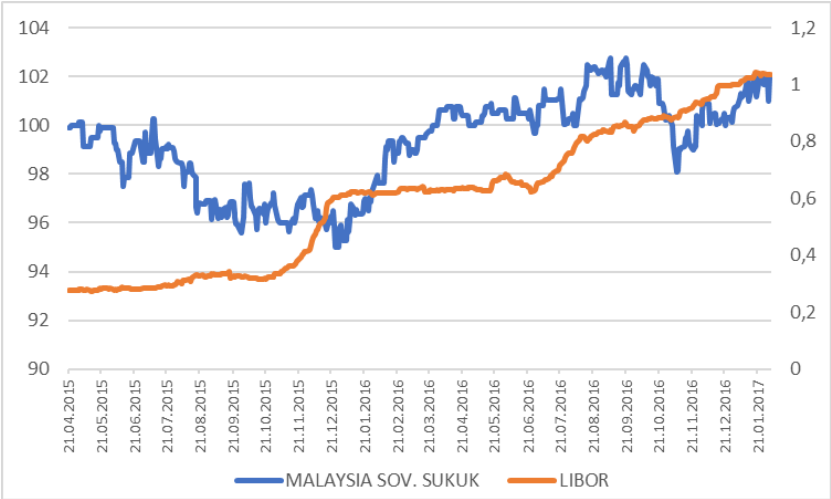
Graph shows that price dynamics of Malaysia sovereign sukuk and Malaysia sovereign bonds are resembling. From the beginning of the period until 21.08.2015 there is a downward trend presented in both certificates, which is then followed by an upward trend till September 2016, after this date the steepest decrease in both prices is seen.

3. LIBOR (Stata: *libor*)

In the first chapter, we did not discover any significant evidence of interconnection between LIBOR and sukuk price. So, dynamics of these two variables are hardly comparable graphically. However, anyway, we provide a graphical analysis of LIBOR and sukuk price.

Graph 4.

Dynamics of Malaysia sov. sukuk price and LIBOR



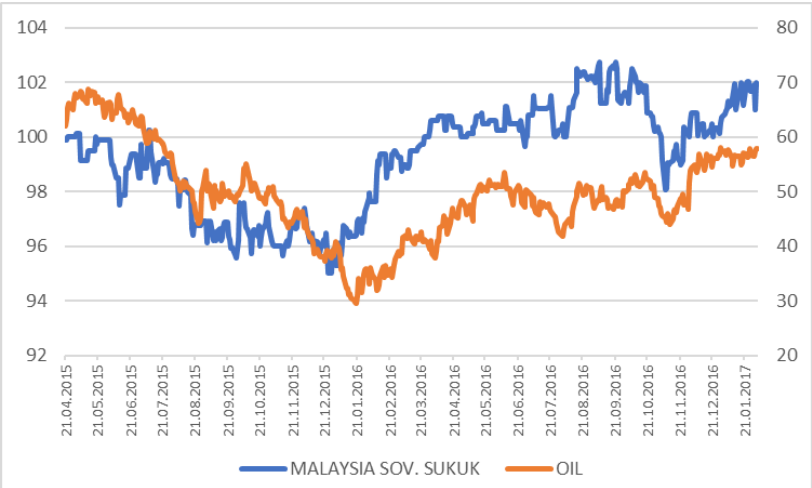
4. Asset prices (Stata: *asset*)

In the prospectus of sukuk issuance oil is stated as the underlying asset for the structure. There are no details about brand of oil, so we have taken prices for Crude Oil of Malaysia for the period from 21.04.2015 till 08.02.2017. Oil price is the most volatile variable in the regression with the standard deviation 8.54 and ranging from USD 29.49 and USD 68.80. this phenomenon can be explained the period selected for our sample, since starting from 2014 global oil markets have become highly volatile. The structure of all sukuk, including ijara sukuk in our regression, imply cash flow generation from underlying asset, so we expect a positive impact of oil prices on the price of sukuk.

The graph below shows the dynamics of sukuk and crude oil.

Graph 5.

Dynamics of Malaysia sov. sukuk price and oil price



Regression 2. Petronas sukuk

Petroliam Nasional Berhad (PETRONAS) was established in 1974. It is a corporation, wholly owned by the Government of Malaysia. As the custodian for Malaysia's national oil and gas resources, it explores, produces and delivers energy sources. Petronas is vested with the all oil and gas resources in Malaysia and is responsible for developing and adding value to these resources. In the ranking of FORTUNE Global 500® Petronas held the 75th place among the largest companies in the world in 2013.

Petronas global sukuk were issued in 2015 and have maturity of 5 years. The issue value is USD 1,250,000,000 with denomination of USD 1,000. The following sukuk have a fixed coupon of 2.707%, paid twice a year. Values obtained are for the period from 19.03.2015 and till the date of data retrieval on 08.02.2017, that sums up with 495 observations.

Table 4.

Descriptive statistics of factors for Regression 2

Variable	*Obs.*	*Mean*	*Std.*	*Min*	*Max*
sukuk	495	100,11	0,96	98,16	102,25
conv	495	100,86	2,26	96,99	105,38
libor	495	0,59	0,25	0,26	1,04
asset	495	50,48	8,36	29,49	68,80

1. Sukuk prices (Stata: *sukuk*)

Table shows that our sample of Petronas sukuk prices ranges from 98.16 and 102.25 with the mean of 100.11 and standard deviation of 0.96.

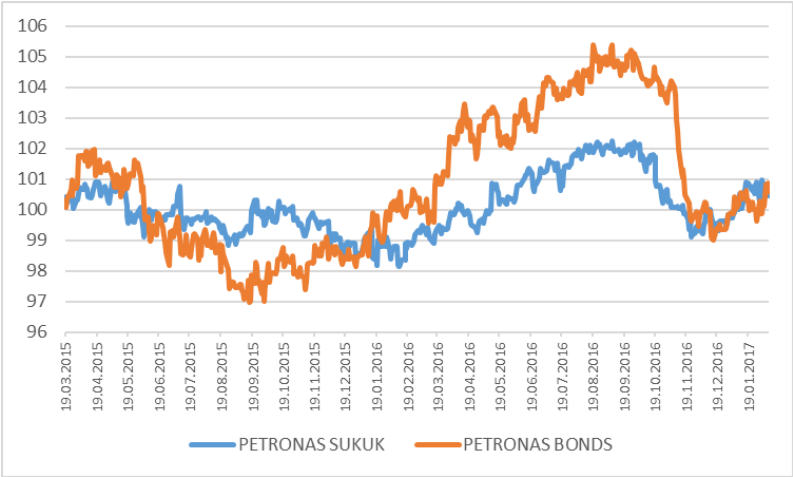
2. Conventional bonds prices (Stata: *conv*)

Petronas capital bonds have the same originator as Petronas Global sukuk. Conventional bonds were issued in 2015 and due on 18.03.2022. Prices retrieved for these bonds are for the same period as for sukuk prices. Coupon payments are 3.125%, which is higher than coupon rate for sukuk 2.707%. Prices of conventional bonds lay in the interval between 96.99 and 105.38 with the mean of 100.86 and a standard deviation of 2.26. The average price of Petronas conventional bonds is slightly higher than price of Petronas sukuk, also conventional bonds are more volatile. In this regression, we also assume that there is the similar pattern for conventional bonds and sukuk, issued by the same originator.

The graph below shows the dynamics of sukuk and conventional bonds issued by Petronas.

Graph 6.

Dynamics of Petronas sukuk price and Petronas bonds price

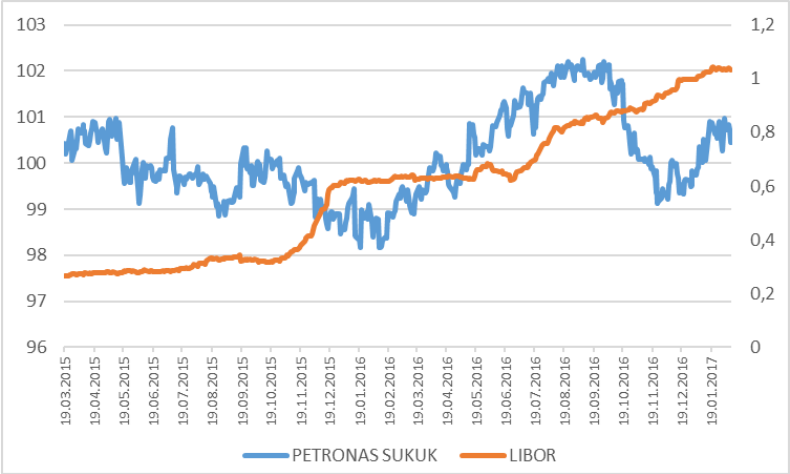


Graph presents that there is the same pattern between two bonds. Although, since December 2015, prices for sukuk and conventional bond started to grow, the growth rate of the latter is much higher. Finally, there was a sharp fall in prices of sukuk and conventional bonds in October 2016, which is the same as for sovereign bonds of Malaysia.

3. LIBOR (Stata: *Libor*)

Graph 7.

Dynamics of Petronas sukuk price and LIBOR



4. Asset prices (Stata: *asset*)

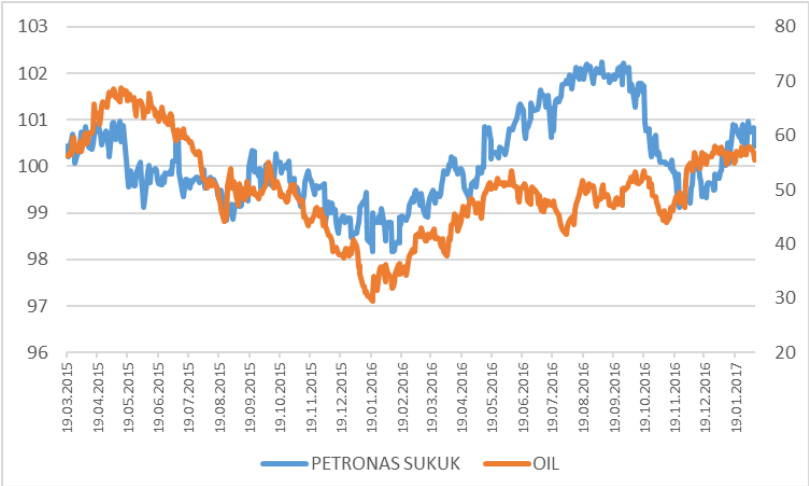
In prospectus of issuance of Petronas Global sukuk, oil is stated as an underlying asset. Issuer does not provide any information about brand of oil. However, since Petronas is an oil and gas multinational corporation and has the right to extract all oil and gas resources in Malaysia, we have taken prices for Crude Oil of Malaysia for the period from 19.03.2015. Descriptive statistics of oil prices for regression 2 are similar as for regression 1, since the same

brand of oil and the same period for analysis were selected. Also, we expect the positive relationship between sukuk price and oil price as it was in regression 1.

The graph below shows the dynamics of sukuk and crude oil.

Graph 8.

Dynamics of Petronas sukuk price and oil price



Regression 3. Cagamas sukuk

Cagamas Berhad is the national mortgage corporation, established to promote the growth of secondary mortgage market in Malaysia. The company issues corporate bonds and sukuk to finance the purchase of housing loans from financial institutions and non-financial institutions. The provision of liquidity to financial institutions at a reasonable cost to the primary lenders of housing loans encourages further expansion of financing for houses at an affordable cost.

Cagamas Global Sukuk Berhad are Islamic bonds with term of 1 year. They were issued on 14.04.2016 and matured on 10.03.2017. The prices obtained are for the period from 14.04.2016 and till the date of data retrieval on 08.02.2017, overall 215 observations. These sukuk are ijara sukuk with prespecified fixed coupon payments of 2.3%.

Table 5.

Descriptive statistics of factors for Regression 3

Variable	*Obs.*	*Mean*	*Std.*	*Min*	*Max*
sukuk	215	100,16	0,04	100,07	100,25
conv	215	100,37	0,35	99,69	100,95
libor	215	0,82	0,14	0,62	1,04
asset	215	1262,70	64,24	1126,52	1368,74

1. Sukuk prices (Stata: *sukuk*)

Prices of Cagamas sukuk are relatively stable, with the mean of USD 100.16 and standard deviation of 0.04. The lowest is price of USD 100.07, the highest is point of USD 100.25

Cagamas sukuk price.

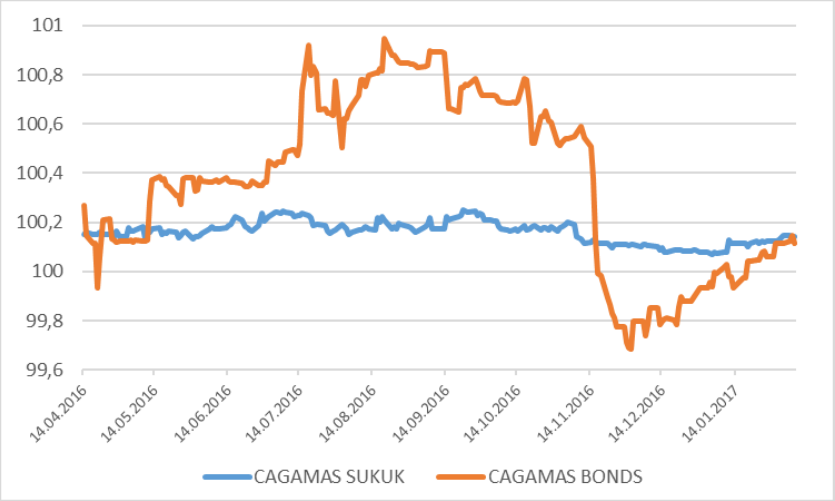
2. Conventional bonds prices (Stata: *conv*)

Cagamas Berhad bonds were issued in 2015 and mature on 20.03.2018. Prices for these bonds are for the period from 14.04.2016 to 08.02.2017. Conventional bonds have fixed coupon payment of 3.95%.

The following graph shows the comparative dynamics of sukuk and corporate bonds of Cagamas Berhad.

Graph 9.

Dynamics of Cagamas sukuk price and Cagamas bonds price

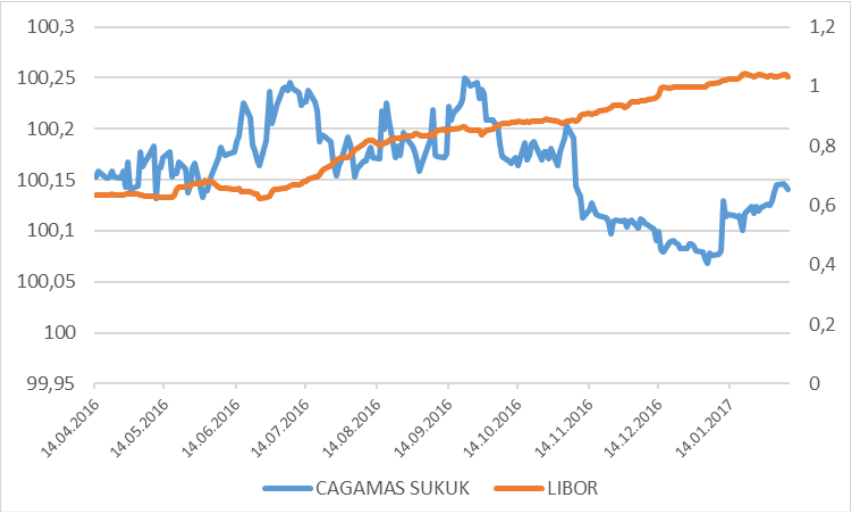


As can be seen from the graph Cagamas conventional bonds are much more volatile than sukuk with the standard deviation of 0.35 and the mean of USD 100.37.

3. LIBOR (Stata: *libor*)

Graph 10.

Dynamics of Cagamas sukuk price and LIBOR



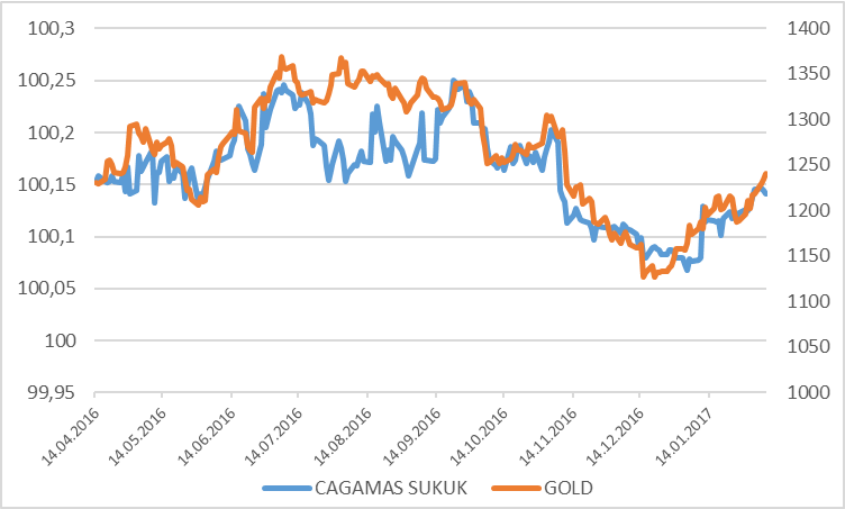
4. Asset prices (Stata: *asset*)

In the prospectus of Cagamas sukuk issuance it is stated that the underlying asset for these bonds is gold. As a variable *asset* for our regression model we have taken global gold prices, Gold Bullion LBM U$/Troy Ounce for the period from 14.04.2016 till 08.02.2017.

The graph below shows the dynamics of sukuk and gold. We expect the positive relationship between asset prices and sukuk prices.

Graph 11.

Dynamics of Cagamas sukuk price and gold price



We compare price of sukuk and conventional bonds for three different issuers presented before. There is a path, presented in the Table 6, that the lowest mean prices have both sukuk and traditional bonds of Malaysia, Petronas issuances of conventional bonds and sukuk have the highest and the medium mean prices, respectively, Cagamas bonds present the opposite trend.

Table 6.

Comparative analysis of factors

Variable	*Mean - Malaysia*	*Mean Petonas*	*Mean - Cagamas*
Sukuk price	99,25	100,11	100,16
Conv. Price	99,62	100,86	100,37

2.4. Econometric analysis

Let us remind that we built regressions with a dependent variable sukuk price for three different issuers. Since we deal with time-series data, we corrected it for non-stationarity by taking first differences.

With the help of the regression we investigate the intercorrelation between the sukuk price and factors such as, conventional bond price, underlying asset and LIBOR. We conduct a

multistep regression analysis. Firstly, we look separately at the interconnection between the price of Islamic bond and each factor. In this step, we investigate whether the following factors, if taken separately, determine the price paid for sukuk. Secondly, we analyze the interconnection of the dependent variable and conventional bond price and LIBOR simultaneously. Thus, we can see how the results of the analysis change when considering independent variables, except the variable that interest us the most – price of underlying asset. Thirdly, we add our core variable and we see whether in reality it is the factor, that influence the sukuk price the most as it predicted by the principles of Islamic bonds.

Table 7-9 present the obtained results for five regression models, made for each sukuk issuer. In all regressions sukuk price of each issuer (*sukuk*) is a dependent variable. The first three columns (I, II, III) reflect the correlation between the sukuk price and conventional bond price of the same issuer (*conv)*, LIBOR (*libor*), asset price (*asset*), if taken separately. The forth column (IV) shows the interconnection between the sukuk price and conventional bond price and LIBOR, taken together. The fifth column (V) also represents the correlation between the sukuk price and all factors, including asset price.

Table 7.

Factors of Malaysia sov. sukuk price

	I	II	III	IV	V
conv	0,624*** (p-value 0,000)			0,622*** (p-value 0,000)	0,638*** (p-value 0,000)
libor		-24,932 (p-value 0,164)		-9,168 (p-value 0,532)	3,314 (p-value 0,808)
asset			0,064*** (p-value 0,000)		0,071*** (p-value 0,000)
observations	468	467	468	467	467
Adj. R	0,337	0,002	0,078	0,339	0,429
Prob > F	0,000	0,165	0,000	0,000	0,000

Note: the symbols *, ** and *** sign the variables significant at the 10%, 5% and 1% levels respectively.

Table 8.

Factors of Petronas sukuk price

	I	II	III	IV	V
conv	0,329*** (p-value 0,000)			0,329*** (p-value 0,000)	0,330*** (p-value 0,000)
libor		-0,656 (p-value 0,940)		2,415 (p-value 0,661)	9,448 (p-value 0,047)
asset			0,035*** (p-value 0,000)		0,037*** (p-value 0,000)
observations	495	494	495	494	494
Adj. R	0,602	-0,002	0,098	0,602	0,707
Prob > F	0,000	0,940	0,000	0,000	0,000

Note: the symbols *, ** and *** sign the variables significant at the 10%, 5% and 1% levels respectively.

Table 9.

Factors of Cagamas sukuk price

	I	II	III	IV	V
conv	0,097*** (p-value 0,000)			0,098*** (p-value 0,000)	0,012 (p-value 0,122)
libor		-0,451 (p-value 0,429)		-0,779 (p-value 0,036)	-0,729* (p-value 0,009)
asset			0,001*** (p-value 0,000)		0,001*** (p-value 0,000)
observations	215	214	215	214	214
Adj. R	0,576	-0,002	0,758	0,583	0,766
Prob > F	0,000	0,429	0,000	0,000	0,000

Note: the symbols *, ** and *** sign the variables significant at the 10%, 5% and 1% levels respectively.

The results of the model are consistent with the preliminary findings of the theoretical analysis and our expectations.

The first thing to mention is that results for three regression models, Malaysia sov. sukuk, Petronas sukuk and Cagamas sukuk are the same. For this reason, we can analyze these models together, since they provide the same findings.

Each table presents that four out of five models are significant. The second regressions for each issuer present Prob > F of 0,165, 0,940 and 0,429 for Malaysia, Petronas and

Cagamas, respectively and, hence, are insignificant. This means that when taken separately LIBOR does not determine the price of sukuk. Moreover, LIBOR factor is insignificant in all models, whether taken together with conventional bond prices (IV) or considered with all factors together (V). Insignificance of LIBOR is presented by all three issuances. It proves that sukuk are not dependent from this interest rate, which is currently discussed among academics.

The significance of the model I for all issuers implies that price of conventional bond is important for the sukuk price, even if taken separately. Moreover, this factor is significant in models IV and V for all originators. The rationale behind the positive correlation between dependent variable and bond price has been discussed in our theoretical overview. Generally, sukuk bonds are still considered as a new instrument and they are issued rarely by the same originator, there is no performance history of such bonds from a particular issuer. For this reason, investors look at the performance of conventional bonds while making a decision whether to invest in sukuk or not.

The main result, we obtained from this analysis is the significance of model III, which means that price of the asset, underlying the structure of sukuk, influences the price this bond, which is proved by all three issuances. Asset variable is also significant in model V at 1% level for sovereign sukuk of Malaysia, Petronas sukuk and Cagamas sukuk. The essential implication of the fifth model (V) is that after adding the market price of commodity as an independent variable the explanatory power of the model increases from 34% to 43% for Malaysian sov. sukuk, from around 60% to 71% for Petronas sukuk model, from 58% to more almost 77% for Cagamas sukuk, signifying that asset price is one of the core factors explaining the price of Islamic bonds. This finding leads to the conclusion that underlying asset plays a role in determining sukuk price, no matter whether it is sovereign or corporate issue. Thus, for the first time the linkage of Shariah-compliant bonds to the real economic activities (in this case underlying commodities) is empirically proved.

The next step in testing unique features of Islamic bonds is to see the influence of specific to sukuk pricing factors on conventional bonds. It means, we provide a multistep regression analysis with conventional bond prices (*conv*) as a dependent variable and LIBOR and underlying asset prices as explanatory variables. We look at the explanatory powers of regression models, significance of those factors in traditional bonds pricing and the nature of the relationship. The analysis is divided according to the issuer of a bond, as it was done previously. The first two columns (I, II) reflect the correlation between bond price and LIBOR (*libor*), asset price (*asset*), if taken separately. The third column (III) shows the interconnection between the bond price and asset price and LIBOR, taken together.

Table 10.

Factors of Malaysia sov. bond price

	I	II	III
asset	-0,009 (p-value 0,382)		-0,001 (p-value 0,949)
libor		1,127*** (p-value 0,001)	1,121** (p-value 0,002)
observations	468	467	467
Adj. R	-0,001	0,021	0,018
Prob > F	0,382	0,001	0,005

Note: the symbols *, ** and *** sign the variables significant at the 10%, 5% and 1% levels respectively.

Table 11.

Factors of Petronas bond price

	I	II	III
asset	-0,002 (p-value 0,849)		0,038 (p-value 0,817)
libor		4,495*** (p-value 0,000)	4,869*** (p-value 0,000)
observations	495	494	494
Adj. R	-0,002	0,246	0,263
Prob > F	0,849	0,000	0,000

Note: the symbols *, ** and *** sign the variables significant at the 10%, 5% and 1% levels respectively.

Table 12.

Factors of Cagamas bond price

	I	II	III
asset	0,002 (p-value 0,102)		0,002 (p-value 0,086)
libor		-7,378*** (p-value 0,000)	-25,601 (p-value 0,131)
observations	215	214	214
Adj. R	0,008	0,589	0,014
Prob > F	0,102	0,000	0,081

Note: the symbols *, ** and *** sign the variables significant at the 10%, 5% and 1% levels respectively.

As can be seen from Tables 10-12 model I with asset prices as an explanatory variable is insignificant for all three issuances, with Prob > F of 0,382, 0,849 and 0,102 for Malaysian sov. issuance, Petronas and Cagamas bonds, respectively. Asset variable is also insignificant in model III for sovereign bonds of Malaysia, Petronas bonds and Cagamas bonds.

Moreover, LIBOR is seen to be significant in model II for all issuances, however the nature of relationship between bonds price and this value is still unclear, since it has a positive coefficient for the first two issuances and a negative sign for Cagamas. Nevertheless, we see the significance of model II in all cases.

The essential implication of the third model (III) is that after adding the market price of commodity as an independent variable the explanatory power of the model falls from 2,1% to 1,8% for Malaysian sov. bonds, while Prob > F increases. In case of Cagamas issuance, adding asset price makes model III insignificant.

These findings signify that asset price does not explain the price of traditional bonds, as it does for sukuk. On the contrary, LIBOR variable shows its' significance in all issuances, which underpins the presence of interconnection between interest rates and bonds. This result leads to the conclusion that the factors determining sukuk price are unique for Islamic finance and do not refer to traditional debt certificates.

2.5. Main findings

In this part, we are going to summarize all the findings of econometric analysis and compare them to the results of prior research on sukuk pricing.

We found that the conventional bond variable is statistically significant in model V for Cagamas sukuk at 10% and in all other models at 1% significance level. The conventional bond price is an important indicator that explains sukuk price. If we invest in ijara sukuk, we can use the price dynamics for the previous conventional bond issuances made by the same originator to help us in our investment. This relationship could mean that sukuk prices react positively to credibility of the issuing company represented by conventional bonds prices. Thus, sukuk bonds possess the same feature of conventional bonds as bearing credit risk or risk of default. It means that even though sukuk bonds have an underlying asset, which possessed by SPV and should be independent from the company's credibility, sukuk coupon payments depend also on company's performance.

Prices for oil and gold are statistically significant and we see that the signs of the coefficients are in line with our predictions. Positive reaction of sukuk prices on prices of underlying assets underpins the distinctive feature of sukuk bonds. It proves that they are an alternative source of funding and should be treated differently. Also, it means that sukuk bonds

may be a beneficial source of diversification for investor's portfolio, which will be further discussed in Chapter 3 of the paper.

The insignificance of LIBOR factor presented by econometric study was also previously confirmed by our theoretical discussions. Moreover, it contradicts to the criticism regarding all Islamic financial instruments as they are connected to interest-based markets. The showed absence of LIBOR influence does not mean that the markets of sukuk are not connected at all to interest-based world. However, it supports the suggestion of some of the scholars that this connection is indirect and, thus, Shariah-compliant.

The final step of analysis showed that underlying asset price has no influence on prices of traditional bonds, which presents the uniqueness of this factors to Islamic financial system.

Summary

In this chapter, we used econometric analysis to identify factors that influence sukuk price. We selected three sukuk issuances, including one sovereign and two corporate issuers, originated in Malaysia; we selected sukuk with different terms of maturity and build regression models.

We have empirically confirmed the existence of positive relationship between the sukuk price and the price of an underlying asset, that is supposed to generate bond's coupon payments and redemption size. Apart from strong impact of asset price on the price paid for sukuk, we have determined the positive relationship between the sukuk price and price of conventional bond with the same issuer. This means that investors in the situation of a lack of data regarding sukuk issuances base their decisions on performance of conventional bonds from the same originator. Moreover, our sample showed the insignificance of LIBOR in sukuk pricing.

These results underpin the main principles of sukuk as linkage to assets and independence from interest rates and may become a reason to stop ongoing discussions towards the questionable uniqueness of Islamic instruments.

CHAPTER 3 – KEY RISKS AND IMPLICATIONS

In the first chapter, we described types of sukuk and their specifics. Further, we collected data on traded issuances and determined factors that influence sukuk prices. Now, to achieve the main goal of our research as it was stated in Introduction part, it is needed to link the determined price factors with risks associated with Islamic bonds. Further, it is worthwhile to consider the managerial implications that are referred to adding sukuk in the portfolio. Thereby, to track whether Islamic financial instruments are a real alternative to currently available sources of funding, or in foreseeable future they are hardly applicable.

Thus, let us name each result found by econometric analysis in the second chapter of the study, then, link it to the sukuk risk and, further, provide associated managerial implications.

First of all, we found that underlying asset is significant factor in all our regression models, with a positive coefficient sign, which fulfills our expectations. Thus, our study empirically proves the linkage of sukuk certificates to real sector activities, which is the main principle of this financial instruments.

Since sukuk are directly related to the real sector, they will not create short-tern speculative movement of funds. However, the underlying assets of sukuk are subject to numerous risks. First is the price risk, which is related to price volatility of an underlying commodities and assets that can directly influence price of sukuk. Price risk is followed by coupon payment risk and asset redemption risk, which are referred to the periodical payments and principal payment, respectively, and both have an impact on fulfillment of contractual obligations by sukuk originator. Mentioned risks are a result of depreciation of an asset, also there are cases of entire loss of assets. All these risks should be taken in account while selecting an underlying asset for sukuk structure. The essential point is that these risks are uniquely attributable to Islamic bonds, conventional bonds are not exposed by this type of risk, which results in underpinned by our research difference between these two instruments and leads to a necessity of a specific treatment of sukuk. Sukuk investors become an asset holders and are tied to the performance of asset pool, consequently, they carry these unique risks.

Another risk, arisen with the linkage of sukuk with underlying asset, is currency or foreign exchange risk. This risk is also associated with conventional bonds, however considering sukuk foreign exchange risk is related to currency mismatch between sukuk certificates and their assets. From investors standpoint, they are protected from any losses by a sukuk issuer, although this does not eliminate losses face by the originator.

From investors standpoint, it is important to pay attention to asset pool of sukuk structure while making investing decision. For example, risks related to assets are minimal for land parcels used as a pool for ijara sukuk, as they are the least volatile in terms of the price and are

not exposed to the risk of loss of an asset. Fortunately, sukuk holders have a right to receive any information on the use of their investments and nature of underlying assets, since sukuk represent an ownership of them.

As for managerial implications, sukuk may be considered as a source of diversification, since their value is forced by alternative factors such as price of assets. Thus, in times of volatility on traditional markets, adding a certificate that is linked to commodities or projects may be beneficial for investor.

The next implication of sukuk is a securitization, which also benefits certificate holders. The inclusion of SPV in sukuk structure allows investors to concentrate more on capacity of assets to meet the agreed coupon and principal payments. Sukuk give an opportunity to manage balance sheet mismatches and securitize long-term assets. Moreover, securitization allows to manage asset classes and to suit them according to investor's risk preferences.

Moreover, our first finding showed that sukuk linkage to real economy is not only a marketing trick, used in order to popularize an alternative financial system, but is a proof that Islamic bonds are intrinsically different from conventional financial instruments. Thus, other principles of Shariah-compliant finance also may be trusted and should not be lost upon compromises for increased profitability. One of these postulates is altruism, regarding to which, sukuk issuances mobilize public sector funds and accumulate funding for development projects. Hence, another managerial implication of sukuk is referred to the usage of these bonds for financing infrastructural, charitable, educational and other spheres that increase social prosperity, since such instruments were initially created for this purpose. There are already successful sukuk issuances that achieved the goal of increasing social welfare. For example, the IDB sukuk raised funding for 21 developing nations for a wide range of projects, including hospitals, mineral water networks, livestock breeding, pharmacology research, rural development, colleges and agricultural irrigation. Large medical complexes in Muslim countries are frequently funded with sukuk certificates, such as Hamad Medical City in Doha, Qatar and government owned hospitals in Malaysia.

The second result of the empirical study is the indicated significance of conventional bond price in sukuk price. It makes sukuk bonds clearer as an instrument for funding by traditional investors. In case of absence of clear pricing methodology of sukuk, prices of conventional bonds may partially forecast future sukuk prices dynamics of the same issuer. This relationship could mean that sukuk prices react positively to credibility of the issuing company represented by conventional bonds prices. Thus, sukuk bonds possess the same feature of conventional bonds as bearing credit risk or risk of default.

Thirdly, all three regression models showed insignificance of LIBOR factor in

determining of price of sukuk. Thus, our study, for the first time in existing literature on matter, empirically indicates that there is no relationship between sukuk bonds and LIBOR. Consequently, sukuk are not exposed to fluctuation in LIBOR and, probably, other market rates. It means that in terms of interest rate risk sukuk bonds are different from conventional bonds, which should be taken into account by investors. Moreover, the independence of sukuk on LIBOR eliminates the main criticism of non-compliance of modern sukuk issuances to Shariah laws. Due to the absence of interest rate risk, popular types of sukuk, for example ijara sukuk, revised in the study, may be able to compete with conventional bonds in terms of benefits provided for investors.

As it was indicated by the analysis provided by the following paper, sukuk are exposed by the different market indicators as conventional certificates. For this reason, by investing in sukuk, it is important to consider them not as instruments that replicate conventional bonds, but as an alternative source of funding.

CONCLUSION

In this research, we discussed and analyzed main principles of sukuk, their types and structures. By providing a detailed analysis of sukuk pricing factors and an econometric study of their significance, we linked risks of sukuk to our empirical results. Further, we provided possible implications of sukuk and competitiveness of Shariah compliant certificates to traditional fixed income securities.

Nevertheless, we showed that ijara sukuk continue to prevail as the most popular structure of sukuk certificates. This is largely due to their unambiguous Shariah conformity and clear to conventional investors leasing scheme. Sukuk have created the global convergence between conventional finance and Islamic finance. A greater pool of investors is attracted to this component of Islamic finance because of the relative simplicity of the functioning and similarity to well-known fixed income securities. For this reason, we used ijara sukuk in our regression models.

The contribution of this paper lays upon an empirical study of relationship of sukuk price with such factors as underlying asset price, LIBOR and conventional bond price, that has been never done before.

Firstly, by presenting the relationship between sukuk and underlying asset's prices, we have proved that Islamic bonds are not a marketing tool, based on religious beliefs, that should attract investors to Islamic finance, but they are authentically linked to real economic sector, which provides a range of benefits for the certificate holders. The opportunities to adjust an asset pool to investor's risk preferences provides benefits of diversification and securitization, which will inevitably allow them to expand globally. Conventional investors may be interested in sukuk ability to provide diversification benefits and accumulate previously untapped Islamic assets and funds to Western markets.

Moreover, the non-speculative nature of sukuk provides advantages for the economies and financial markets in the sense of more discipline and more financial stability.

The principle of increasing social prosperity, embedded in sukuk, allows to accumulate funds for development projects, which will play an important role in popularizing these instruments in emerging markets.

Secondly, by finding an insignificance of LIBOR variable in our model, we showed that, sukuk are unique instruments, that there are not exposed by the market forces, which are associated with traditional fixed income instruments and, thus, should be treated differently.

On the other side, this study showed that novel financial instruments bring with them, not only benefits, but also original financial risks. The new risks related to underlying assets expose sukuk structures. Since investors become owners of the assets, their investing decisions should

not be based on the credit rating of an issuer, but rather on the capacity of asset pool to generate sufficient for periodical and principal payments profits.

The study suggested that despite the globalization of financial markets and increased convergence of Islamic finance and conventional markets, the Shariah-compliant system is able to be unaffected by market rates and, thus, interest rate risk.

Despite the rapid growth of sukuk market, the number of agents is relatively small, which imposes liquidity risk, which was supported by significance of conventional bond prices in our econometric study. Moreover, the lack of available information on tradable issuances makes a data collection for our regression model more difficult. Thus, success of sukuk will largely depend on their ability to evolve into highly liquid means of fund investment with structured and open secondary market.

To conclude, we expect that sukuk will evolve and encourage Muslim and conventional investors worldwide to Muslim funding structures and, hence, will be instrumental in expanding and deepening the markets of Islamic bonds, particularly in the emerging countries.

However, unique to sukuk risks as well as other financial risks require the development of Islamic financial risk management techniques, the analysis of which goes beyond the scope of this research.

Indeed, sukuk provide an important research agenda for the future. Although our study provides a unique for existing literature research framework, it only partially covers some of the important points regarding sukuk global development. There is more work to be done and these topics can be expanded upon in further studies. We can address important topics for future research that might be considered, such as a development of unified sukuk pricing model or analyzing specific for sukuk risk management instruments.

REFERENCES

AAOIFI Investment Sukuk (Shar'iah Standard No. 18), Manama: Accounting and Auditing Organization for Islamic Financial Institutions, 2002.

Abdullah, S. Islamic Banking and the Interest: A Study of the Prohibition of Riba and its Contemporary Interpretation, Leiden, 1996.

Ahmad, N., & Rahim, A. S. (2013). Sukuk Ijarah Vs. Sukuk Musyarakah: Investigating Post-Crisis Stock Market Reactions. // International Journal of Humanities and Management Sciences. – 1(1). – 87–91.

Ahmed, E., Islam, Md., Abdullah, T. (2014). Islamic Sukuk: Pricing Mechanism and Rating Contribution/Originality. // Journal of Asian Scientific Research. – 4 (11). – 640-648.

Alam, N., Hassan, M. K., & Haque, M. A. (2013). Are Islamic Bonds Different From Conventional Bonds? International Evidence From Capital Market Tests. // Borsa Istanbul Review. – 13(3). – 22–29.

Al-Ashmawi, M. S. Reforming Islam and Islamic Law, - Muslim Perspectives, 2007.

Ariff, M., & Safari, M. (2015). Valuation Of Islamic Debt Instruments, The Sukuk: Lessons For Market Development. // Islamic banking and finance – Essays on corporate finance, efficiency and product development. Doha, Qatar: Bloomsbury Qatar Foundation.

Ariff, M., Safari, M., Mohamad S. Sukuk securities, their definitions, classification and pricing issues, 2012.

Ariffin, Mohd. N., Archer, S., Karim, R. A. Risks in Islamic banks: Evidence from empirical research. // Journal of Banking Regulation. – № 10. – 2008. – pp. 153-163.

Ashhari, Z. M., Chun, L. S., & Nassir, A. M. (2009). Conventional Vs. Islamic Bond Announcements: The Effects On Shareholders' Wealth. // International Journal of Business and Management. – 4(6). – 105–111.

Bacha, O. I. Adopting Mudarabah Financing To Contemporary Realities: A Proposed Financing Structure. // Accounting Commerce and Finance: The Islamic Perspective. – 1997. – Vol. 1, No.1. – pp. 26-54.

Cakir, S., Raei, F. Sukuk vs. Eurobonds: Is There a Difference in Value-at-Risk? - IMF Working Paper, 2007.

Chapra, M. U., Ahmed H. (2002), Corporate Governance in Islamic Financial Institutions, Jeddah: Islamic Research and Training Institute/Islamic Development Bank.

Chapra, M. U., Khan T. (2000), Regulation and Supervision of Islamic Banks, Jeddah: Islamic Research and Training Institute/Islamic Development Bank.

Deloitte (2015), Corporate Sukuk in Europe. Alternative Financing for Investment Projects.

El-Gamal, M. A. Islamic Finance: Law, Economics and Practice. - Cambridge, 2006.

Fitch (2015), Islamic Finance Report.

Ismail, M. I. (2002), Islamic Private Debt Securities: Issues & Challenges, Rating Agency Malaysia Berhad (RAM). // RAM report on March 2002, Malaysia.

Iqbal, M., Llewellyn, D. T. Islamic Banking and Finance: New Perspectives in Profit Sharing and Risk, London: Edward Elgar Publishers, 2002.

Khan, T., Habib, A. Risk Management: An Analysis of Issues in the Islamic Financial Industry, Jeddah: IRTI Occasional Paper №5, 2001.

McMillen, M. J. T. (2007b). Contractual Enforceability Issues: Sukuk And Capital Markets Development. // Chicago Journal of International Law. –7(2). – 427–468.

Miller, N., Challoner, J., & Aziza, A. (2007). UK welcomes the sukuk. International Financial Law Review, 26(5), 24–25.

Naifar, N., Mseddi, S. Sukuk spread determinants and pricing model methodology. // Afro-Asian Journal of Finance and Accounting, 2013.

Neftci, S. N., Santos, A. O. Puttable and Extendable Bonds: Developing Interest-rate Derivatives for Developing Countries, International Monetary Fund. 2003.

Oseni, U., & Hassan, M. K. (2015). Regulating The Governing Law Clauses In Sukuk Transactions. // Journal Of Banking Regulation. – 16(3). – 220–249.

Rabindranath, V., Gubta, P. (2010). An Overview Sukuk Market in Saudi Arabia, Watheeqa Capital Company.

Rahman, A. R. (2003). Accounting Regulatory Issues On Investments In Islamic Bonds. // International Journal of Islamic Financial Services. – 4(4). – 20–35.

Rahman, F. Islam and Modernity: Transformation of an Intellectual Tradition. – The University of Chicago Press, Ltd., London, 1982.

Rodinson, M. Islam and Capitalism. – Pantheon Books, 1974.

Rosly, S. A., Zaini, Mohd. A. Risk-return analysis of Islamic banks' investment deposits and shareholders' fund // Managerial Finance. – 2008. – Vol. 34, No. 10. – pp. 695 – 707.

Saeed, A., & Salah, O. (2014). Development of Sukuk: Pragmatic and Idealist Approaches to Sukuk Structures. Journal of International Banking Law and Regulation, 1, 41–52.

Said, A., & Grassa, R. (2013). The determinants of sukuk market development: does macroeconomic factors influence the construction of certain structure of sukuk? // Journal of Applied Finance and Banking, 3(5), 251–267.

Sarker, Mohd. A. Islamic Banking in Bangladesh: Performance, Problems & Prospects. // International Journal of Islamic Financial Services. – Vol. 1, No. 3.

Shaikh, S. A. A Critical Analysis of Mudarabah & A New Approach to Equity Financing in

Islamic Finance. // Journal of Islamic Banking & Finance. – 2011. – Vol. 28, No. 3.

Tariq, A., A. (2004) Managing Financial Risks of Sukuk Structures, Loughborough University, UK.

Usmani, T. (2008). Sukuk and their contemporary applications.

Warde, I. Islamic Finance in the Global Economy, 2010.

Wilson, R. (2008). Innovation in structuring of sukuk securities. Humanomics, 24(3), 170–181.