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Composite Islamic Finance Index: A performance base measure of Islamic Financial Sector of Pakistan

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Abstract
Islamic indices are now paramount to Islamic Finance because they specify how Islamic investors evaluate the financial markets and the spectrum of financial instruments available for investment. This research created Pakistan's first-ever Islamic Finance Index (IFI). It incorporates a total of five variables, including IBFIN (Islamic Banks Financing), IBINV (Islamic Banks Investment), IBROA (Islamic Banks Return on Assets), IBROE (Islamic Bank's Return on Equity), and TCPBT (Takaful Companies Profit Before Tax) regarding Islamic insurance. Annual data from 2005 to 2022 was incorporated. The principal component analysis (PCA) was used to create this index, and various diagnostics were applied. The results revealed that Pakistan's Islamic finance industry gradually increased from 2005 and peaked in 2020, then declined slightly during COVID-19 but is on track to rise again from the third quarter of 2021 till now. The study's final results divulged that Pakistan's Islamic financial industry was not severely affected and was strong enough to survive during COVID-19 rather than collapse. This study is precious in serving policymakers, financial analysts, and potential investors in understanding the performance of Pakistan's overall Islamic finance industry.
Keywords: Islamic Banking & Finance, Islamic Insurance, Islamic Finance Index (IFI), PCA (Principal Component Analysis)

1. Introduction & Background

Islamic Finance pertains to the availability of financial services like banking, lending, saving practices, etc, according to the Shari'ah Islamic law, regulations, and guidelines. Islamic Finance enforces recommendations for saving, investing, and lending. The moral principles by which many Muslims live are sometimes referred to as "Shari'ah." The two foremost tenets of Islamic banking are (1st) the distribution of profits & losses and (2nd) limiting the ability of creditors and investors to collect and pay interest. Establishing such an Islamic system is to comply with the Quran and Sunnah's rules and regulations since the modern system of Islamic financial institutions (IFIs) is based on Shari'ah rules. A strong Banking and Finance System ensures the efficient allocation of financial resources to stimulate economic progress. The banking division is an economic growth and transformation operator as it serves as a conduit for cash distribution within the community, encouraging investment that helps expand the real estate market. The best economic growth comes from expanding the real estate sector.

As a consequence, the welfare of the country's citizens may also improve. Meanwhile, high economic growth may only sometimes be the best factor for people's well-being. There must be justice in the economy to reduce social inequality in the country.

In the last 20 years, Islamic banking and Finance have expanded significantly in Muslim nations and globally. The formation of the Islamic banking industry benefited the economy of several nations and sped up development. Growth in this kind of banking is a current source to raise a nation's macroeconomic effectiveness (Paratami et al., 2022; Ali & Audi, 2023). In recent years, Islamic Finance has become increasingly popular and has widened to many non-Muslim countries in Asia and Europe (Alam, 2019; Audi & Ali, 2023). The Islamic Finance Country Index (IFCI), created by London-based Islamic finance consultancy firm 'Edbiz Consulting', ranks around 50 countries worldwide based on how well they develop, promote and protect Islamic banking and Finance. Iran, Malaysia, Saudi Arabia, Bahrain, Kuwait, United Arab Emirates (UAE), Indonesia, and Sudan are the eight countries that precede Pakistan in the world rankings.

1.1. Islamic Financial Sector of Pakistan During COVID-19 Pandemic

The global economy has been cruelly affected by the COVID-19 occurrence. The epidemic also had an impact on the banking sector. This virus has affected both the financial industry and the stock markets. The global industry of Islamic Finance proved to be stable in 2020, the first year of the pandemic, while the total size of its assets jumped by 14%, but only in the following year it demonstrated an even greater character when the growth of 17% exceeded the indicators of the previous year. COVID-19 will increase assets of up to 4 trillion US dollars (IFDI, 2022). The COVID-19 pandemic's effects on Pakistan's stock indexes, both Islamic and traditional scrutinized, revealed that Islamic and conventional stock indices performed alike during the pandemic. This worldwide crisis forced investors to avoid risk, and trading activity deteriorated (Ali et al., 2022; Ali et al., 2023).

1.2. Islamic Insurance (Takaful) Sector of Pakistan

One of the most crucial elements of the financial system is the Insurance sector, which is responsible for restoring the system in the event of damage or an emergency. Takaful is the "Risk Sharing Model." Using takaful, sometimes called "Islamic insurance," businesses can reduce financial risk caused by unforeseen events. The concept of Shari'ah-compliant insurance is based on the concept of cohesion and camaraderie among members. Takaful is more of a financial product than a religious one. Regardless of religion, this is appropriate (Htay, Hamat, Ismail, and Salman, 2014). Like insurance, takaful allows you to receive financial assistance while avoiding the prohibited elements of regular insurance schemes. Takaful is recognized as a noble insurance for several reasons, including this one (Kasim et al., 2016; Audi et al., 2021).

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1.3. Islamic Finance Indices

Within the markets for Finance, indices are used as a yardstick to compare the performance of one stock, bond, or mutual fund to the performance of the whole market. Any summary measure intended to capture a specific attribute (segregation, diversity, etc) in a single number is also frequently referred to as an index. Investors use these indexes to evaluate the performance of Shari'ah investments and create goods compatible with Islamic values. The Islamic index follows Shari'ah principles. They use various liquidity selection criteria and financial ratios (Hakim and Rashidian, 2002). Financial indices are essential tools for investors and financial professionals as they provide a benchmark against which they can compare the performance of their investments. They also provide insight into broader market trends and can be used to make informed investment decisions. Hameed et al. (2004), through their journals, have suggested two different kinds of indices. Islamicity Disclosure Index (IDI) and Islamicity Performance Index (IPI). These indices were created to assist the stakeholders, such as shareholders, depositors, government agencies, and religious organizations, in assessing the performance of Islamic financial organizations. Thus, the success of investment funds and other Shari'ah-compliant financial instruments is measured by a set of financial performance indicators known as Islamic financial indices. These indices evaluate the success of assets according to Islamic principles using various monetary and moral standards.

Table 1: Islamic Finance Country Index (IFCI)

IFCI Rank	Country
1	Iran
2	Malaysia
3	Saudi Arabia
4	Bahrain
5	Kuwait
6	UAE
7	Indonesia
8	Sudan
9	Pakistan
10	Qatar
11	Bangladesh
12	Turkey
13	United Kingdom
14	Egypt
15	USA
16	Jordan
17	Brunei Darussalam
18	Yemen
19	Lebanon
20	Singapore

Source: (Humayon Dar, 2014)[7]

Some of the critical criteria used in Islamic financial indices include:

Shari'ah Compliance: Investments must comply with the doctrine of Islamic law, which disallows interest-based transactions (riba) and investments in companies related to industries such as gambling, alcohol, tobacco, and weapons.

Ethical Investments: Indexes may also include social and religious responsibility criteria, such as investments in companies that do not harm the environment or influence society in a favorable way.

Each Islamic index provides insight into the respective market's performance and serves as a benchmark for investors and fund managers to assess investment performance and market trends. Islamic indices are now essential to Islamic Finance because they define how Islamic investors estimate the markets and identify the universe of securities open for investment. Numerous Islamic indexes have already been developed that attempted to develop IBs' performance measures. Antara et al. (2016) concentrated on the Islamic Finance literacy index; they have developed a quantification and reliability methodology that can help policymakers understand the literacy levels of the intended population. The Islamic Financial Literacy (IFL) scale is a detailed scale that covers all aspects of the Shari'ah finance system, including banking, shari'ah compliant insurance, and investment management.

In Pakistan there are currently three Shari'ah-compliant indices on PSX:

1) PSX-KMI All Share Index;
2) KMI 30 Index; and
3) Meezan Pakistan Index (MZNPI).

[7] Growth of Islamic banking and finance in Pakistan. Report Published in The Express Tribune, March 3rd, 2014.

1.4. Rationale of constructing Islamic Finance Indices

The goals of creating Islamic Financial Indices may vary depending on the purpose and scope of the index. Some of the general purposes of creating Islamic Financial Indexes are:

- **To track the performance of a specific market:** Financial indices can be used to track the business of Islamic financial markets or sectors, such as the stock market or the bond market. The index can act as a benchmark for investors and analysts to estimate the performance of individual stocks or bonds with the overall market.
- **To assess how well a specific asset category is doing:** Financial indices can be applied to gauge the effectiveness of a specific asset class such as stocks, bonds, or commodities. This can provide investors with information about the relative performance of different asset classes and help them make investment decisions.
- **Give an idea of the general state of the economy:** Financial indices can be used as a barometer of the overall health of the economy. For example, a stock market index can be used to gauge investor sentiment and confidence in the economy.

Investors in Pakistan might use these Islamic financial index to build up investment products according to Islamic principles also evaluate the success of such investments. In Pakistan, Islamic finance is becoming more admired and more investors are looking for investment opportunities that are compatible with their religious beliefs. Among other things, they support the expansion of Islamic finance in Pakistan.

1.5. Problem Statement

Each nation's financial system plays a crucial role in how successful its economy is. The country Pakistan is one of the large country that has 96 % Muslim people almost 22 million. So, this majority population has the belief to invest with and in limits of Islamic Shariah/laws. Any country can grow economically when its financial system is robust. So, in Pakistan to judge the demand of Islamic Finance system is necessary. So, it is essential to design an Islamic Finance Index (IFI) that can evaluate the Islamic financial system and its trend in Pakistan. So, due to these rigor beliefs, there is need to include all related factors including in Islamic Banking and Insurance (Takaful) sectors. There is a lack of such an index that can evaluate the performance of these sectors.

1.6. Research Gap

Many studies have been found on Islamic banking & finance around the world, and even Islamic financial indices have been created, which take into account not only the influence of various causes in these indices, but also the power of the Shari'ah compliant financial system on the nation's economic structure. Even in a developing country like Pakistan, much research has been done on Islamic Banking & finance. In a study 2022, the Financial Liberation Index (FLI) of Pakistan is created, which showed the profitability of financial reforms. In the same way Islamic indices have also been created for the stock market for investors who wants to invest in Islamic Stocks, Bonds and Securities, but there is a need of Islamic Financial indices for Shari'ah insurance & banking to explore the working of Islamic Financial Market in Financial sector of Pakistan. Therefore it is necessary to create an Islamic finance index for Pakistan, in which Islamic banking & insurance industry is being included. So far, no such Islamic index has been established in Pakistan. This research bridges this gap by being the first to develop an Islamic Finance Index (IFI) using the key parameters of Islamic banking & insurance industry of Pakistan.

1.7. Research Questions & Objective of the Study

Q#1: How the fluctuations might be found in Islamic Finance Index (IFI)?

Q#2: Is the Islamic Financial Sector of Pakistan is resilient and strong enough to survive during crises like COVID-19 pandemic?

Following is the core objective of the study;

- ✓ To investigate the trends and fluctuations in the Islamic Financial market of Pakistan through Islamic Finance Index (IFI).
- ✓ To investigate the Islamic Financial Sector of Pakistan during crises like COVID-19 pandemic.

Islamic banking industry is flourishing in Pakistan rapidity. The percentage of Islamic banking deposits and assets in Pakistan's overall banking sector has grown to 22% and 20.2% respectively, and investments reached 16.6% by the closing date of December 2022 (SBP, IBB, 2022). Thus, expansion of adherent to Islamic financing will support the direction to boost magnification of economy.

2. Literature Review

Idrees et al. (2022) Using various financial policy measures, a bi-directional financial liberalization index (FLI) was created for Pakistan. The purpose of this study, which used a PCA approach over a 39-year period from 1980 to 2018, was to determine the aggregate outcome of a financial index creation situation. In this study, the extent of financial liberalization was examined using 14 financial policy variables. This study provides the FLI for Pakistan, which reflects changes in the implementation process in real time. The developed indicator showed that before 1998, the fixed return of financial reforms was constantly high. However, the impact of financial reforms between 1997 and 2003 was surprisingly positive. After 2004, the documented pace of liberalization slowed further, continuing until 2018. Thus, it was found that assessing the level of financial liberalization is one of the important regulations and liberalization indicators. Policymakers have focused on the consistency of the liberalization index to collect performance data based on various fiscal policy indicators that have been in place since 2004.

Badr and Tahar Tayachi (2021) in their study explained that Saudi Arabia's insurance industry considers itself to be among the Gulf's biggest and most rapidly expanding key marketplace for Islamic insurance and insurance company services in the Middle East and North Africa. This study examined the differences among traditional insurance and Takaful in Saudi Arabia. This research was carried out with a quantitative methodology. The intended sample for this study consisted of faculty members of Effat University, clients of financial institutions and banks, and representatives of businesses and organizations. There were 150 responses in the sample. A survey was carried out to get data. The key findings of this study showed that takaful is preferred and these are expanding in Islamic nations to traditional insurance. The authors advised conducting a correlation statistical study and learning more about the subject for your next paper.

Hudaefi and Noordin (2019) in a study analyzed the effectiveness of 11 Shari'ah Banks chosen at random from various nations using the developed yardstick. This study applied the mix-mode approach. To build the IBs performance measure, the qualitative technique is used initially. An integrated maqasid al-Shari'ah based performance metric was created in this study (IMSPM). Evidence from 11 IBs showed that they are making an effort to implement maqasid al-Shari'ah in the banking sector. This argument may be the most effective way to counter the practice of victimizing IBs for not abiding by Shari'ah or for mirroring traditional banks.

Ali et al. (2019), Shah & Ali (2022), Shah & Ali (2023) measured the three criteria of the Indonesian Islamic Financial Inclusion Index accessibility, affordability, and utilization of Shari'ah banking offerings are listed below. The correlation involving the Human Development Index (HDI) and the IFII was also assessed. The study discovered that Indonesia's access to Shari'ah financial services is low. The results also indicated a favorable association among the IFII index and the HDI. Provinces by means of the maximum IFII may see a higher HDI. It was found that to increase availability of finance for small-income groups, particularly in eastern Indonesia, especially in the provinces of East Nusa Tenggara and Papua, both policy-makers and the non-conventional financial sector require to take part in a superior responsibility.

Babar et al. (2019) created a Financial Stability Index (FSI) for the Pakistan's monetary industry by using financial statements throughout the years 2001–2011. Based on the weighted equal variance method, the logistic technique and the linear probability approach, three separate index classes were created in this study. This study furthermore appraised the forecasting accuracy of the financial strength index. The study's findings demonstrated that when using the stepwise approach in order to create the FSI, the results for return on assets and return on equity were identical as both profitability measures exhibited the same behavior. It is argued that the study's financial sustainability indices can help decision makers detect and prevent future shocks.

Mutia et al. (2019) in their research explained that the Islamism Performance Index is among the techniques for measuring the performance of Islamic banks in financial terms together with the rule of justice, halal and purification. This study's goal was to evaluate the Islamism index of an Islamic bank as an indicator of performance. Descriptive statistical analysis was performed in this study. The study, covering the period from 2011 to 2015, included Indonesian Islamic banks. So far, seven banks have been selected as a sample using purposive sampling technique. The Islamism Performance Index used five ratios to assess performance. According to the ratio analysis, Bank Muamalat Indonesia has successfully implemented charitable activities to ensure the benefit of directors and staff, and also achieved high performance in profit sharing ratio. In another respect, Bank Syariah Mandiri has done well in its fair share ratio performance. In contrast, Sharia bank BRI (Bank Rakyat Indonesia) came out on top when comparing the share of Islamic and non-Islamic income. The general conclusion is that Islamic banks used the Islamism Success Index to measure success. The results of this study can help stakeholders including authorities, investors and clients for analysis the operations of Islamic banks and provide a basis for policy development regarding banking activities, investment choice and decision making.

Zaheer and Rasool (2017) constructed an index for the Shari'ah banking sector that was based on the maqasid al-Shari'ah and allows for the evaluation of the effectiveness of Islamic banks in light of the Maqasid al-Shari'ah. The data span was 32 quarters beginning in June 2002 and ending in March 2010. This research used an index created utilizing information and data from their financial statements and other sources in order to assess the accomplishment of 5 Islamic banks in Pakistan. The index displayed a rating for each bank based on quantitative and qualitative data. The study discovered that banks with more responsible behaviour in terms of their financial standing and loyalty to Shari'ah more effectively fulfill the requirements of maqasid al-Shari'ah and, as a result, rank higher on the index.

Ascarya et al. (2016) also developed The Islamic Bank Maqasid Index (IBMI) is based on Al-Ghazali's five main maqasid, or objectives. Weights are applied to the 8 dimensions of each objective, which were created based on the 42 criteria proposed by Chapra (2008) using the analytical network process method. Due to the lack of observed data on additional dimensions, this study was only able to analyze four factors for each objective in assessing the working of 12 Islamic banks from Indonesia and other countries using the index. This study used a comprehensive IBMI model to evaluate the Islamism of Islamic banks using Shariah-based criteria (specifically the Islamic Bank Maqashid Index or IBMI). In this study, weights were assigned using the ANP method, element and relationship dimensions were partitioned using the behavioral science approach of Sekaran, Bedouin pentagon, and IBMI was calculated using the simple additive weighting (SAW) method. All Islamic banks were assigned a low degree of Islamism, or IBMI, using the Bedoui and SAW procedures developed by the Pentagon. Islamic banks pay more attention to "preservation of wealth" and "preservation of intelligence". Moreover, compared to all other Islamic banks, Indonesia's BNI Syariah, Bank Syariah Mandiri and BRI Syariah are the most Islamic. The highest levels of Islamism or IBMI in 2013 were found in Pakistan's Meezan Bank, Indonesia's BNI Syariah, Syariah Mandiri Bank, Permata Syariah Bank, Bank Islam Malaysia Berhad, Kuwait Finance House and Dubai Islamic Bank. These results showed that despite the profit-oriented nature of an Islamic bank, it must adhere to the objectives of Shari'ah. As a result, Islamic banking must be carried out in accordance with the ideal of Islamic banking, which combines business orientation with social orientation, individual and public interests, and short-term and long-term goals.

Morris (2010) in his research used banking sector information from March 1997 to March 2010 to create an aggregate financial stability index (AFSI) for Jamaica. By combining macroeconomic, international, and microeconomic indicators of banking sector operations into a solitary financial stability metric, the AFSI was developed based on previous work for Jamaica. This indicator accurately reflected significant periods during times of financial distress under review and demonstrated an overall improvement in stability. Econometric data confirmed how sensitive the index is to the volatility of important macroeconomic indicators. In light of this, a Monte Carlo simulation was conducted to anticipate steadiness in finances for the coming year to help policymakers assess the future level of banking sector responsiveness. In addition, projected values indicated a noticeable decline in the index in the second half of 2010.

Haniffa and Hudaib (2007) in a study developed the Ethical Identity Index to examine the effectiveness of IB inside the Gulf area. EII contrasts the perfect persona of the IB with the actual characteristics of the organization as seen in twelve-monthly reports. Eight sizes and 78 different designs were used to create five motifs that best reflected the ethical identity of the ideal IB. The research

employed a checklist approach to assess annual report data. A lofty value of index indicated that IB performance is excellent and similar. Conversely, though, a low level of EII suggests that IBs must strengthen their disclosures in their annual reports to gain a viable gain. They discovered that Islamic Bank of Bahrain surpasses the other 6 samples using this technique.

Ibrahim et al. (2004) analyzed the performance of Bahrain Islamic Bank (BIB) and BIMB was assessed using Islamic Disclosure Index and IQI Index. The IB's capacity to present appropriate information to stakeholders is measured by the IDI. Shari'ah conformity, business management and ecological protection are all included in the IDI's measurements. Meanwhile, IQI evaluates the performance of Zakat (charity), fair distribution, directors' and employees' welfare, both type of investments and incomes. The researchers found that BIB was better than BIMB at informing stakeholders through the generated IQIs and IDIs. The fundamental concept of IDI and IQI seems vital to include when constructing an IB performance benchmark, even if that benchmark does not contain financial measures

2.1. Conceptual Framework of IFI (Islamic Finance Index)

Following is the conceptual framework of IFI index.

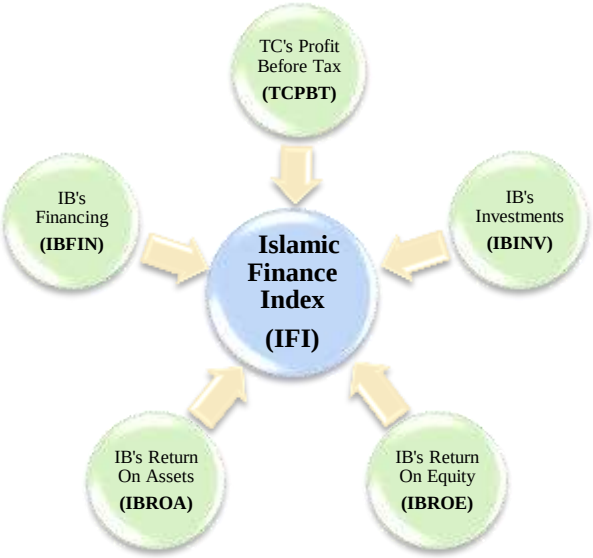

Figure 1: Conceptual Framework of Islamic Finance Index (IFI)

Above is the model of Islamic Finance Index (IFI) based on literature. This index includes five important parameters of Islamic Finance, out of which four variables are from Islamic Banking and one is from Islamic Insurance i.e., Takaful. This model shows the association between IB's (Islamic Banks) and TC's (Takaful Companies) variables i.e., IB's Financing (IBFIN), IB's investment (IBINV), Islamic Banks Return on Assets (IBROA), IB's Return on Equity (IBROE), and TC's Profit before Tax in Pakistan. These variables are used to create the first model, resulting in an Islamic Finance Index. The cumulative impact of these five parameters is shown by this index.

2.2. Data Collection & Sources

The data collection, time period, variables sources of the study is explained as follows. Data was retrieved from 2005 to 2022 following Sources:

- IFSB, (Islamic Financial Services Board), (www.ifsb.org/)
- SBP, (State Bank of Pakistan), (www.sbp.org.pk/index.html)
- Dawood takaful, (www.dawoodtakaful.com)
- Salaam Takaful , (www.salaamtakaful.com)
- Pak-Qatar Family Takaful , (www.pakqatar.com.pk)
- Pak-Qatar General Takaful, (www.pakqatar.com.pk)

Missing data is a common problem in research where some observations or values are not available for certain variables in the data set. Incomplete data can bias the results of models and reduce model accuracy. This can happen for a variety of reasons, such as dropouts, measurement errors, or non-response to specific questions. General approaches to the solution of the problem of missing data includes a Complete-Case Analysis, from which subjects with missing data are left out, as well as an analysis of the Mean-Value Imputation in which missing values are substituted by the mean this variable in those subjects who do not have it Austin et al., (2021). The average (mean) of the observed values for that variable is used as a replacement for missing values in this technique. In this study the IFI's underlying data included some missing values, some of which were filled up by averaging.

2.2.1.Summary of Variables of IFI Model

Table 2 below illustrated the summary of variables that are used in IFI index making. The description and measurement in this table are taken from data sources.

Table 2: Summary of Variables of IFI Model

Sr. No.	Variable	Description	Measurement	Data Type
1	IBFIN	Islamic Bank's Financing	Million Rupees	Time Series Half-Yearly Data
2	IBINV	Islamic Bank's Investments	Million Rupees	Time Series Half-Yearly Data
3	IBROE	Islamic Bank's Return on Assets	Percentage	Time Series Quarterly Data
4	IBROA	Islamic Bank's Return on Equity	Percentage	Time Series Quarterly Data
5	TCPBT	Takaful Companies Profit Before Tax	Million Rupees	Time Series Annual Data

2.3. Definitions & explanations of variables of the model

2.3.1. Islamic Bank's Financing (IBFIN)

The process of giving money for a venture, acquisition, or investment is referred to as funding. By lending such funds, banks along with other financial organizations help investors, businesses, and consumers achieve their goals. You can take out a loan from the bank, but only if you agreed to pay interest over the loan balance. To put it another way, financing is the act of borrowing money with the intent of repaying it together with an extra charge or interest during a predetermined time frame. In this study All Islamic Scheduled Banks Financing is taken into account.

2.3.2. Islamic Bank's Investments (IBINV)

A subset of banking known as "investment banking" assists people and businesses in raising funds and offering financial advising services. They assist new businesses in going public by serving as middlemen between investors and securities issuers. In this study All Islamic Scheduled Banks Investments are taken into account.

2.3.3. Islamic Bank's Return on Equity (IBROE)

Return on equity (ROE) measures how efficiently a corporation earns a return on the money investors put into the business. Mainly non-financial companies center of attention on earnings per share (EPS) growth, while ROE is a key metric for banks. ROE of All Islamic Banks are taken in this study.

2.3.4. Islamic Bank's Return on Assets (IBROA)

ROA is a financial ratio that indicates how gainful a firm is compared to the whole assets. ROA can be employed by business organization, investors and analysts to evaluate how well a firm is using its assets to produce profits. This analysis included the return on assets of all Islamic banks.

2.3.5. Takaful Companies Profit before Tax (TCPBT)

This is the entire profit of the company without taking into account any taxes. Profit before tax can be found on the income statement as operating income less interest. Data were taken from 4 Takaful Companies. This study used their profit before tax (TCPBT).

3. Research Approach and Methods

To design the index, Principal Component Analysis (PCA) is used by using secondary data, it is a statistical technique used in research as to change a large variable set into a more manageable group of unrelated variables named principal components while trying to retain as much information as possible. Pearson (1901) was the one who initially introduced the principle component method (PCM), and Hotelling (1933) improved it. Campell et al (1997) described PCA as a method to reduce number of variables to analyze without losing too much information in covariance matrix. In this research, PCA method is used to create an Index in software SPSS V21.

3.1. Economic Function of IFI Model

Economic Function of IFI Model is as follows:

$$IFI = f(IBFIN, IBINV, IBROE, IBROA, TCPBT) \quad \ldots\ldots\ldots (1)$$

Where

IFI = Islamic Finance Index
IBFIN = Islamic Bank's Financing
IBINV = Islamic Bank's Investments
IBROE = Islamic Bank's Return on Equity
IBROA = Islamic Bank's Return on Assets
TCPBT = Takaful Companies Profit Before Tax

4. Data Analysis and Results Interpretations

This section will discuss the results of data analysis using PCA approach to make IFI. Various diagnostic tests are used to apply PCA index making. The results of these diagnostic tests and PCA test results are shown and their interpretation is also being discussed as follows.

4.1. Reliability Analysis

Consistency and repeatability of measurements is called reliability. Cronbach's alpha is in this investigation to evaluate the reliability or internal consistency of the variables used to create the IFI. "Rho-equivalent reliability" as well as "coefficient alpha" are the other names for Cronbach's alpha. It is a measure of internal consistency that evaluates how closely a group of elements are connected within a scale or index. It is used to evaluate the reliability of a scale by measuring the extent to which the scale items evaluate the same fundamental idea. Higher values of Cronbach's alpha (usually above 0.70 or 0.80) indicate greater internal consistency between variables. It spans from 0 to 1 and represents the extent to which test objects have identical measurements. Cronbachs Alpha is

typically used as a dependability measure in social and behavioural studies (Liu, Wu, & Zumbo, 2010). It is suitable to use Cronbachs Alpha for the reliability of the index. The results of the test are shown in the table 3 below.

Table 3: Results of Reliability Statistics

Cronbach's Alpha	N of Items
.614	5

Source: authors' calculations

The Cronbach's Alpha of the Islamic Finance Index is .614 in the table 3. A measurement's dependability is deemed sufficient when the coefficient alpha is 0.70 or above (Cronbach, 1951; Nunnally & Bernstein, 1978). Nonetheless, it was suggested by several other statisticians that Cronbach's alpha exceeding 0.6 is suitable (Shelby, 2011). So coefficient alpha of .614 is considered acceptable. This process was done using SPSS 21.

4.2. KMO and Barlett's Test

Principal Component Analysis (PCA) diagnostic tests such as the KMO (Kaiser-Meyer-Olkin) and Bartlett (1954) test are often used to determine whether data is appropriate and valid for component analysis, especially for creating indexes. They reveal details regarding the suitability of the data set and whether there is overall variation between variables.

Thus, both the above tests provide information on the suitability of the data for SAR. The KMO test evaluates the overall sufficiency of the data sample, while the Bartlett test checks for significant correlations between variables. These tests help ensure that the PCA is appropriate and that the resulting principal components will be meaningful for further analysis or interpretation. The results of KMO and Bartlett's Test are shown in the table 4.

Table 4: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.807
Bartlett'sTest of Sphericity	Approx.Chi-Square	134.295
	Df	10
	Sig.	.000

Source: authors' calculations

The results shows that value of KMO is .807 which means KMO>0.6 it indicates that the data has high common variance, making PCA a suitable technique. Since the p-value for the test statistic is less than the chosen significance level of 0.05, the null hypothesis is rejected by the Bartlett test. A significant p-value indicates that the variables are sufficiently related to conduct PCA and that the correlation matrix is not an identity matrix. Since both the Bartlett test is significant and the KMO is above the threshold, we can start building Islamic Finance Index with PCA.

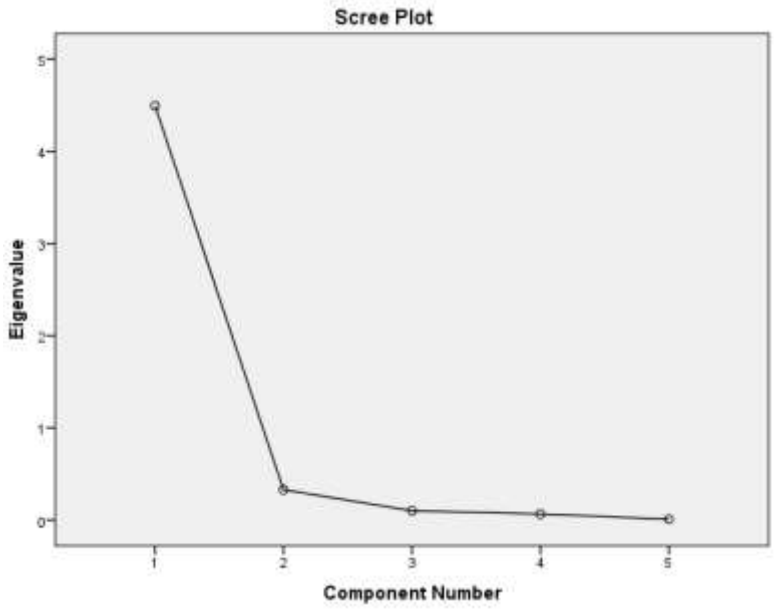

Figure 2: Scree Plot of making IFI

4.2.1. Scree Plot

To choose how many principal components to keep after dimensionality reduction, the scree plot is a graphical tool used in Principal Component Analysis (PCA). This allows you to see the eigenvalues of the main component and determine the threshold beyond which the additional components do not significantly increase the explanation of the variance. Cattell (1966) proposed a graphical test to determine number of factors. Scree plot eigenvalue quantities are on vertical access, with eigenvalue numbers that make up the horizontal axis. Eigenvalues represented by points on the graph, and the line connects consecutive values. Factor extraction are

must come to an end when the narrative levels out, or at the "elbow". Thus scree plot helps to select the correct number of components to create a PCA index.

The scree plot determined the optimal amount of components. The eigenvalue of each component in the original solution is graphical. The eigenvalue of a factor is the amount the overall variance is explained by that factor. As a rule we want to extract components on a steep slope. By keeping the main components up to the point of inflection, we capture the most important information while reducing the dimensionality of your data. Elements on a small slope show little in response to study, so using the first component is an easy and acceptable choice.

4.3. Results and Interpretations of Principal Component Analysis (PCA)

After analyzing the above diagnostics, the primary rationale of this research is to find out the level of Islamic Finance of Pakistan by extracting, composite indicator named IFI.

4.3.1. Total Variance Explained

Total Variance Explained is an important concept in constructing a Principal Component Analysis (PCA) index. It depicts the proportion of the total variability in the original dataset that is accounted for by the remaining principal components. This helps to understand how much information is retained when data is reduced with PCA. In PCA, principal components are ordered based on their own values. The data's greatest variation is stated by the first principal component (PC1), which is followed by the second principal component (PC2), and so on. The sum of the eigenvalues of all stored principal components gives the total explained variance. The quantity of principal components that must be kept can be determined by examining the cumulative total explained variance. The overall threshold is to retain components that jointly enlighten an ample percentage of the total variance (e.g., 80% or 90%) to extract the most crucial information from the initial dataset even as it lowers its dimensionality.

Table 5: Results of Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.493	89.853	89.853	4.493	89.853	89.853
2	.330	6.601	96.455			
3	.101	2.025	98.480			
4	.067	1.330	99.810			
5	.010	.190	100.000			

Source: authors' calculation, Extraction Method: Principal Component Analysis

In the above table 5 results showed the cumulative percentage of variance in the first component is 89.853%. It means that the first component extracted is giving maximum information from the all set. So the first component generated in this study via this statistical technique is the outcome, that will be used as an independent variable as IFI of Pakistan in the next problem regression / ARDL analysis.

4.4. Correlation Analysis

The correlation matrix is a fundamental component of Principal Component Analysis (PCA) and is commonly used in the index creation process. It provides information about the relationships and patterns of communication between the original variables, which helps to identify the underlying structure and determine the composition of the built index. It shows the 3 types of correlations strong positive correlations, strong negative correlations, weak correlations. The following table 6 of correlation matrix shows the various associations as follows. The correlation matrix exhibits the high correlation among all variables which shows that these variables are suitable to make an index using PCA. These values are highly correlated because same kind of characteristics are required in all parameters to make the index.

Table 6: Results of Correlation Matrix

	IBROA	IBROE	IBFIN	IBINV	TCPBT
IBROA	1.000				
IBROE	.988	1.000			
IBFIN	.815	.845	1.000		
IBINV	.852	.864	.898	1.000	
TCPBT	.936	.947	.763	.815	1.000

Source: authors' calculation, Extraction Method: Principal Component Analysis

4.5. Islamic Finance Index (IFI) of Pakistan

The following table 7 will give a summary of the results after reliable analysis by using the PCA test and data normalization technique mentioned in the methodology part. Range is generated from 0 to 1 that shows the Islamic Finance Index (IFI) of Pakistan.

4.6. Graphical Representation of IFI (Islamic Finance Index) of Pakistan

Further we will see its graphical representation to know IFI of Pakistan. That will show its trend over time from 2005 to 2022, is elaborated in the following section.

It can be seen from this IFI graph that Islamic Banking & finance Industry in Pakistan faced difficulties in the beginning because of the conventional financial system is more well-liked among the people due to its prevalence and higher returns. Another reason is

that there is not much awareness among people of Pakistan about Islamic Financial services. The IFI curve in the graph figure 3 shows the trends and fluctuations in Pakistan's Islamic finance industry. The graph of the Islamic finance index, shows that since 2005 Pakistan's Islamic finance industry has grown steadily until 2020 when the industry was at its peak, after a short period of decline, the industry has recovered again and has been increasing since the third quarter of 2021, indicating the fact that Pakistan's Islamic financing sector is on a trajectory of expansion.

Table 7: IFI (Islamic Finance Index) of Pakistan

Years	IBROA	IBROE	IBFIN	IBINV	TCPBT	IFI Index
2005	0.0048	0.068	81463.73	4028.33	81463.8	0
2006	0.0040	0.066	114965.69	10302.74	114965.76	0.002059592
2007	0.0052	0.062	177475.41	37050.89	177475.48	0.013264997
2008	0.0056	0.076	269087.31	68495.9	269087.39	0.028324491
2009	0.0060	0.032	299295.56	102134.73	299295.6	0.031138587
2010	0.0068	0.035	356545.89	196683.47	356545.93	0.051143142
2011	0.0072	0.076	404758.74	445213.36	404758.82	0.095237448
2012	0.0200	0.112	450634.39	662667.06	450634.52	0.15821135
2013	0.0077	0.108	676570.61	748155.06	676570.73	0.166058872
2014	0.0504	0.734	881228.59	616109.1	881229.37	0.324429959
2015	0.0377	0.613	1181853.8	798989.5	1181854.47	0.337548813
2016	0.0412	0.623	1520555.7	1067441.3	1520556.36	0.412989026
2017	0.0407	0.615	2198372.2	992210.5	2198372.86	0.462092967
2018	0.0455	0.746	2809657.9	977683.28	2809658.65	0.540588581
2019	0.0770	1.345	3206154.1	1188465.9	3206155.52	0.738268651
2020	0.0998	1.639	3402994.4	1710147.2	6609623.94	1
2021	0.0854	1.530	1692549.5	1187189.6	7081705.51	0.796059585
2022	0.1282	1.789	2218288	1211139.3	7032368.28	0.944153103

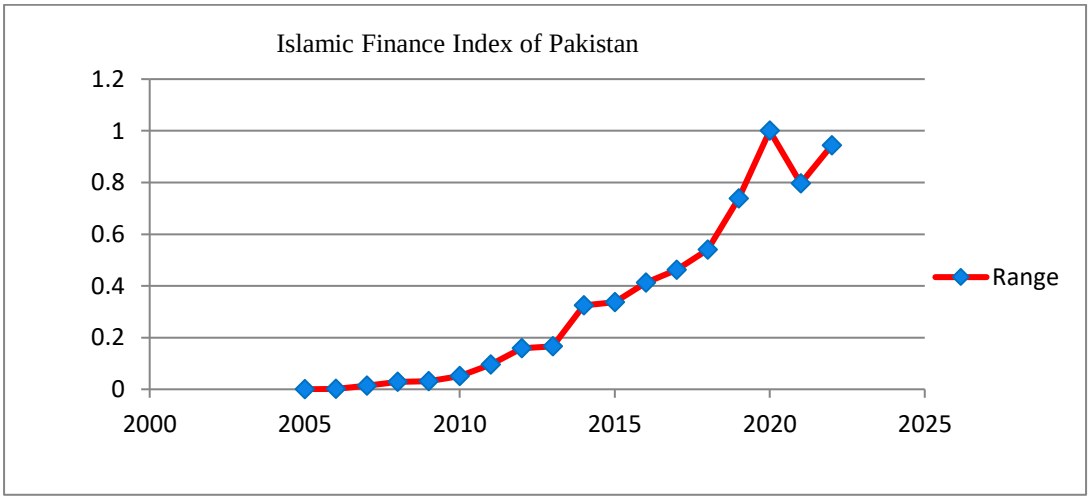

Figure 3: IFI (Islamic Finance Index) of Pakistan

5. Conclusion of Study

The rapid expansion of Islamic financial businesses and the growing interest in this Islamic finance field demand a more in-depth assessment of the Islamic financial parameters of the economy. The core rationale of the existing study is to develop an IFI that includes Pakistan's Islamic banking and takaful sectors. The ups and downs in Pakistan's Islamic financial system can be noted over time. Over 18 years, from 2005 to 2022, this study analyzed annual time series data of Pakistan gathered from multiple databases. The study used the PCA method to create the IFI index by taking five variables from the Islamic Banking sector (IBFIN), (IBINV), (IBROA), (and IBROE) and one variable from the Takaful industry (including four takaful companies) (TCPBT). Numerous diagnostic tests were incorporated, including Reliability Analysis, KMO and Barlett's test, Scree Plot, Total Variance Explained, and Correlation Analysis. The authors concluded the results, scaled from 0 to 1, and normalized using the Min-Max data normalization procedure to become a range.

The PCA's findings revealed that since 2005, Pakistan's Islamic finance sector had steadily expanded until 2020 when it peaked during the first wave of Covid-19 in 2020. The IFI index showed a decline after the third quarter of 2020. Then, from the third quarter of 2021, the IFI continuously showed an upward trend in Pakistan's Islamic Financial industry when there was a second wave of COVID-19. This demonstrates that Pakistan's Islamic banking system is resilient enough to withstand a pandemic like COVID-19 without collapsing and that the COVID-19 pandemic has not detrimentally impacted it. This shows the resilience of the Islamic Financial Industry during the Pandemic. As mentioned by Hasan et al. (2022), Islamic financial markets are also similar in

resilience to the COVID-19 pandemic as compared to conventional markets; the empirical evaluations have shown that severe market volatility caused by COVID-19 affects both Islamic and conventional stock indices approximately equally. Almonifi and Gulzar (2021) discovered that Islamic banks could react to monetary and economic crises when they compared their findings with those of other comparable studies.

Moreover, Islamic banks can continue offering valuable services and successfully managing their financial activities during and after the crisis. This demonstrated that Shari'ah-compliant banks have successfully overcome financial and economic emergencies. Our results are also encouraging at some extent as compared to Almonifi and Gulzar's study. As in Our IFI's findings until 2020, when it peaked, Pakistan's Islamic finance industry has grown consistently. This sector experienced a short period of decline but has since bounced back and is expanding from the third quarter of 2021, showing how effectively the Islamic financial sector of Pakistan has handled such a crisis. This indicates that Pakistan's Islamic financial industry was not severely affected by the COVID-19 pandemic, which means that the Islamic Financial sector is strong enough to survive a pandemic like COVID-19 rather than collapse. This shows that the Islamic finance industry is crucial to Pakistan's financial and economic growth. When there is financial stability, there is economic stability in the country, which will lead the country to the path of financial and economic progress.

5.1. Practical & Academics Contributions

This Islamic Finance Index (IFI) is an excellent contribution to Islamic Banks (IBs) and Takaful Companies (TCs) in Pakistan. This ground-breaking study will provide the most statistics available to academics, businesspeople, and other interested parties who want to gain a realistic knowledge of the degree to which Shari'ah banks and Takaful Companies have pushed Shari'ah-compliant financial services would find this study to be helpful. This study made clear that a nation's success should be judged by its Islamic financial system.

This work will have academic relevance as an addition to the corpus of knowledge. Policymakers and financial sector specialists will find the general state of the Islamic Financial Industry by analyzing the IFI index. This will be beneficial in analyzing the long-term impact of the variations and trends on the Islamic financial industry of a country like Pakistan.

Practically, this study will help develop financial policies that consider the benefits of Islamic banking and Islamic Insurance in the Islamic finance system of the country. Policymakers will find this information beneficial in evaluating the nation's financial situation and developing the most effective plans to upgrade this industry. Consequently, this study will help Islamic industry players make better future verdicts for Islamic financial industry enrichment, leading to financial growth in developing nations like Pakistan.

5.2. Limitations of the Research

As any research has some limitations, this research also has some limitations. Due to limited resources, the breadth of this research was somewhat constrained, and the researcher performed it while remaining within her scope, which may be expanded. The researcher had to work with data only available for a short period. The researcher had minimal time for research; with a little more time, a more thorough investigation could have been conducted, leading to better results.

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