FACTORS AFFECTING BOND MARKET DEVELOPMENT IN ASIAN DEVELOPING COUNTRIES

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ABSTRACT

A financial market is considered to play a key role in economic stability. An economy should encourage investments to achieve financial stability. Bond markets develop a platform for foreign investors to invest their funds in an alternative method of investment other than bank deposits. Maintaining an effective bond market will increase the fund flows to the economy and aggregate spending, ultimately increasing the economic growth of a particular economy. Therefore, developing a bond market is a mandatory requirement for the economic expansion of a country. There are many factors affecting bond market development. However, these factors can vary due to a particular country's economic condition. As this is an emerging area, a limited number of examines have been carried out. Further, examining the factors affecting bond market expansion in Asian growing countries and the impact of COVID-19 is important as there are no prior studies have been conducted. Therefore, this investigation is being done to look at the factors affecting bond market development in seven developing Asian countries for twelve years from 2010-2021 using panel data regression. The study used seven independent variables namely, the size of the banking system, interest rate spread, money supply, inflation, external debt, economic size, stock market capitalization, and dummy variable of COVID-19 while using the bond market development as the dependent variable. The main element influencing the bond market's growth is the banking system's size. It suggests that local credit offered by banking system changes impacts the bond market’s growth. Another important element influencing the growth of the bond market is the interest rate spread. The lending rate and deposit rates should be a concern for policymakers and decision-makers. Changes in those rates imply that it influences the expansion of the bond market. The M2 money supply suggests that changes in the money supply affect how the bond market develops. Another important consideration in the growth of the bond market is inflation.

Keywords: Bond Market Development, Asian Developing Countries, COVID-19, Economic Growth

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1. INTRODUCTION

The financial sector includes a set of institutions, instruments, and markets and a legal and regulatory framework that permits lending transactions. (Vo and Ho, 2021). Throughout history, differing information, enforcement, and transaction costs together with diverse legislative, regulatory, and tax regimes have pushed distinct financial contracts, markets, and intermediaries. Furthermore, rising income levels and savings levels have led to the initiation and expansion of the financial system (Azmeh,2021). The primary goal of the financial system is to smooth the economic resources to be distributed both physically and temporally in a changing environment. This system consists of the fundamental payment system through which almost all transactions are cleared as well as financial intermediaries and the money, fixed-income, equities, futures, and options markets. (Merton, 1990). Financial markets and intermediaries, such as the banking sector, are a part of every functional financial system. However, the benefits that these two typical financial sectors make to the overall financial system and economy vary substantially across countries. (Allen, Qian and Naim, 2012).

The financial market is regarded as a metaphor for a country's economic progress and financial stability. The financial market encourages people to save and make the most use of their money, ensuring that money flows freely in the economy. It provides money to individuals and organizations. The high amount of foreign currency deposits aids the advancement of a robust bond market. The public sector invests in bonds to maintain supervision and secure advantageousness in the capital market. For market development, multinational investors place a premium on government bond liquidity. A country's bond market expansion is reliant on a number of elements, including a sound government, productive fiscal and monetary policy, updated and productive tax and duty administrative systems, and an autonomous financial system. Due to a lack of effective laws, a failure to generate long-term capital, and unpredictable demand, bond markets in most Asian countries are poor. The bond market's utility is critical for any country's understanding of real returns and possible investor portfolios. (Braun & Briones, 2006)

Any marketable security that is produced by a government or a corporation to collect funds is known as a bond (Security Exchange Commission (SEC), 2010). Bonds are debt instruments, much like Investor Own Utilities (IOU). Borrowers issue bonds to entice financing from investors who intend to give them a debt for a given span of time. An investor who purchases a bond from the Securities and Exchange Commission of the United States loans money to the issuer, which could be a business, community, or government. The bond's main value, also known as "maturity," "maturity," or par value, is paid by the issuer in return for a fixed interest rate that will be paid for the duration of the bond's existence. (Nneka et al. 2022).

Bond markets in developing countries appear to be an appealing investment target for a variety of reasons. To begin with, many developing countries' bond markets are rapidly expanding. Second, since the 1990s, the bond market has been the second

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most important method of finance in emerging communities. Third, in recent decades, the liquidity and transparency of the bond markets in emerging countries have increased (Muharam et al. 2018; Nnenna, Ngeh and Boden, 2020). Investors are therefore considering all of their alternatives for investing in growing countries' bond markets. Issued bonds can be purchased by both foreign and domestic investors, and the bond issuers can Advantages from significant financing. Foreign bond markets are the marketplaces where a country's bonds are issued and exchanged by non-domiciled companies (Nneka et al. 2022).

According to Thukral, Sridhar and Joshi, 2015), bonds evolved as a long-term funding alternative to bank finance, which has been around for millennia. Without a healthy bond market, a financial system will absent a rate of interest established by the market, a genuine volume of the cost of capital, and will deploy its savings unsuccessful. Local currency bonds play a key role in constructing the yield curve on currencies, which is the foundation for developing risk management tools. The nature of bond market development has been variable due to the system and makeup of economies around the nations. Through the creation of bond markets domestically, emerging states have been able to avoid currency mismatches, and interest rate differentials have benefited them. While a well-expanded bond market would imply that both the government and private parties are adequately represented, the former appears to have seized a larger share of the credit pie.

According to Spricic and Wilson (2007), the mature financial market's corporate bond market is an important component. In the previous ten years had seen the development of a local bond market has drawn attention owing to its favorable impact on the expansion of the financial and economic systems as well as the numerous benefits that a corporate bond market offers. The ties between the banking and business sectors, an established market for government bonds, and standards and regulations that oversee financial markets and provide security for investors are the most crucial factors for the successful creation of a corporate bond market. Institutions such as pension funds and life insurance companies are institutional investors that invest heavily in bonds. Because they have long-term accumulated funds. As a result, industrialized countries with the preconditions have more established corporate bond markets.

The 2007–2008 global financial crisis followed the repetition of experiences of the preceding two decades' worth of financial calamities, including the 1997 Asian financial collapse, and the 2011–2012 European debt crisis, both developing and developed nations acknowledged the necessity of bond market growth (Bhattacharya & Nath, 2011). The lack of already established and extended bond markets in many industrialized economies up to 1990, and in nearly all emerging nations up to 2000, contributed to the over-reliance on the banking industry. As a result, the world's economies grasped the importance of reducing reliance on the banking sector and developing more robust and regional bond markets that are effective. The conception of a sophisticated bond market not only diversifies governmental and corporate finance but also makes the economy more resilient to financial crises. Furthermore, a

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bond market improves the country's entire financial system's efficiency. Furthermore, bond market development is becoming increasingly important, particularly for Asian nations. These economies have been working to integrate regional economies through infrastructure, which necessitates large and long-term investments. As a result, long-term bonds are the finest accessible tools for raising needed funds from regional resources. (Spricic & Wilson, 2007).

Bond finance has spread throughout the world and is now a key source of funding for both public and private sector projects in the majority of economies. Given the vital role the bond market plays in interacting with insufficient funds, it is essential those organized endeavors be made to secure its long-term expansion. Developing countries have traditionally depended heavily on collaborators in the creation and their banking systems for external debt finance, often ignoring the bond market. (Musah, Badu and Adjei, 2019).

Most of the economies' private and public sectors use bond financing for their financial needs. The bonds typically fill a significant task in the financial system. The bond is categorized as a fixed-income security. The bond is a more attractive or feasible method of financing developed or developing economies. The bond is essential for economic growth because the government finances its fund needs by issuing treasury or government bonds to continue projects such as infrastructure development, investment projects, and other financial needs (a cover budget deficit) (Nneka et al. 2022). Corporate sector issues corporate bonds for their financial needs. Bonds are continuing major task for economic development (Gyntelberg et al., 2005). The fact that Asian countries relied too heavily on domestic borrowing, and on commercial banks was one of the factors contributing to the financial collapse of 1997. The bond market, the second greatest approach to business financing, was underdeveloped and controlled, making banks the primary source of capital. On the other side, the global financial collapse of 2008 made it challenging for businesses to get local and foreign currency liquidity as foreign banks withdrew significant investments from Asia. (Bhattacharya & Nath, 2011). According to Barrio et al., (2009) international factors, particularly overall risk perception, are found to play a significant influence in explaining the difference in government bond yield. These findings imply that despite the fact that domestic variables like liquidity and sovereign risk are significant drivers of yield spreads, macroeconomic fundamentals and general risk aversion interact strongly. Additionally, domestic factors' impact on bond yields increased noticeably throughout the crisis. Government bond yield spreads may continue to be higher than they were before to the situation due to the different ways in which the crisis affected the public finances of Member States and the projection that investors will become more risk-averse after the problem.

Because of its capacity compared to GDP across all market divisions, the consistently reliable mix of private and public issuers, and the growing dominance of financial institutions over non-financial firms, a well-developed bond market sustains any economy. The level of overall economic development, especially in the private sector, has an obvious effect on how the bond market develops. (Braun & Briones, 2006).

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The intention of this study is to identify the variables affecting the development of the Asian bond market. Given that Asia is home to most of the world's fastest-developing nations, determining the factors that influence the growth of the Asian bond market is crucial. Thus, the development of the bond market will fasten their economic growth. Being an emerging area of research, a smaller number of published studies are available. This type of study was conducted based on Ghana, Africa, China, and Bangladesh. Further, few prior studies have been conducted using a sample in Asia. But it is very difficult to find a study that takes a collection of developing countries in Asia as a sample. Past studies examined a variety of factors that might affect Ghana's, the African region, and the European region's growth in the bond market. Further, no or no published web prior study has been conducted to investigate the consequences of COVID-19 on bond market development in Asian developing countries. Thus, this can be identified as the empirical gap in the study.

1.1. Contribution

A well-developed bond market is a strength for any economy. It is significant to identify key factors in order to expand the bond market, which is important for economic development. This research is an effort to the decision-makers of the bond market, policymakers, and any party interested in the bond market.

2. LITERATURE REVIEW

2.1. Theoretical Review

According to (Musah, Badu and Adjei, 2019) most of the economy's private and public sectors use bond financing for their financial needs. The financial system's relevance and centrality in any economy's growth are undeniable. Therefore, finance experts have stated that a well-expanded financial system increases the productivity of the financial system and the expansion of an effective economic system (Fabella and Madhur, 2003). Further, bonds typically fill a significant void in the financial markets by delivering a return that more than covers the cost of funding over the payback duration (Fabella and Madhur, 2003). Investment options in the financial markets are limited by non-bond investments.

Every country is paying close attention to the domestic financial market and provides the necessary support to ensure financial stability and well-being. In this regard, it is to comprehend local bond market policy involvement and its implications for financial market structure. (Hassan et al., 2020). There are three most important stakeholders related to developing the bond market in any country namely, the government, international investors, and domestic financial actors (Mehrara and Ghamati, 2014). The Government's commitment to increase the capital through foreign direct investments is beneficial to the development of a strong bond market. Further, bond investments are made by the government to control and ensure better performance of the capital market. Foreign investors invest in the bond market to uplift economic development (Fabella and Madhur, 2003).

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Bonds help to finance government deficits while preserving the economy's stability, paying for infrastructure improvements, and financing long-term growth. Banks, retirement plans, mutual funds, and hedge funds are a few examples of domestic entities with the ability to influence the bond market. (Hassan et al., 2020). According to Sukcharoensin (2017), bond markets with aggressive positioning will be those with appealing strategic stances and stable economic conditions. Further, financial stability typically helps the market maintain its incentive against rivals and the bond market may fully capitalize on its chances to explore acquisition targets and grow market share. Generally, in an unstable market environment, the bond market with a competitive posture will be the one with an appealing industry (Hassan et al., 2020). According to Nneka et al., (2022) after the financial crisis, the Asian bond market considerably increased its size. Thus, the government and corporate bond balances increased without affecting the GDP ratio from US$414.1 billion in 1997 to US$10.179 trillion in 2016. To expand government bond markets, the nations are progressively avoiding aid-reliant nations. According to Dung et al., 2015), the corporate bond markets in Southeast Asia, highlight the need for banking and corporate sector changes, as well as the enforcement of legal procedures and more business transparency, to make these markets more appealing. The East Asian bond market suggested that for these countries to be forward-looking, Additionally, it's crucial to finish the post-crisis agenda in order to restructure the banking sector, enhance corporate governance, strengthen the regulatory environment for this market, rationalize taxation, increase the pool of investors, and provide incentives for the establishment of regional bond market hubs. (Fabella & Madhur, 2003). Gyntelberg et al., (2005) While investigating the region's corporate bond markets, we encountered significant challenges when trying to develop the Asian corporate bond market. Although secondary markets had a smaller investor base, weaker microstructures, and information asymmetry, primary markets were dependent on quasi-state issuers. Ringui (2010) was able to take use of several characteristics of Kenyan markets for corporate bonds with due consideration of the market's stage of development, the political and macroeconomic climate, supervisory and regulatory frameworks, efficient market structures, and numerous intermediaries. The author discovered that various variables affect the growth of corporate bonds in Kenya, including macroeconomic variables, the political atmosphere inside the nation, the investor pool, the regulatory environment, the size of the banking sector, and the complexity of the issuance procedure. By conducting a structural analysis of 60 publicly traded companies on the Nairobi Stock Exchange, this was discovered.

2.1.1. *Factors that influence the bond market*

According to (Musah, Badu and Adjei, 2019), Macroeconomic stability, the abolition of tax disadvantages, and market participation are necessary for the bond market to be viable. Additionally, interest rates, exchange rate volatility, a lack of public sector funding requirements, and interest rate volatility all negatively impact the bond market's growth. Although government engagement in fiscal policy and the bond market is necessary, study on the subject necessitates rigorous analysis of the causal relationships between the important variables. Turner (2003) claims that the issues

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that are typically cited as slowing the expansion of bond markets frequently point to flaws in governmental policies. The demand for local currency paper is hampered by a history of high and fluctuating inflation. This has frequently been accompanied by extremely pronounced exchange rate volatility. These conditions have forced even short-term interest rates to be kept significantly above levels often seen in global markets.

According to Bhattacharya and Nath (2011), using the current gross domestic product (GDP), as a proportion of the size of the economy, the size of the bond market, and the banking system's exports and domestic credit were calculated. The economy and GDP per capita were calculated using GDP at purchasing power parity (PPP). By subtracting the loan rate from the deposit rate, the interest spread was calculated. The volatility of exchange rates for a given year was calculated using the standard deviation of its 12-month exchange prices. Ahwireng-Obeng, S. A . and Ahwireng-Obeng, F. (2020) identified important factors that affect bond market development. The size of the domestic sovereign bond market means the ratio of GDP to the logarithm of outstanding sovereign debt. Apart from the local currency, cash flows from debt settlements involving foreign currency are considered when calculating the dependent variable. Further, household debt is used as a stand-in for banking, expressed as a percentage of GDP delivered to the private sector industry size. A higher ratio signifies a huge banking industry and, as a result, a lower market for sovereign debt. Particularly for economies that have issued significant amounts of debt to the investment public, the size of the banking sector is important. Greater bank lending may result from a high concentration of banks, while bond financing may be discouraged. Economy size is calculated by the natural logarithm of the GDP. The exchange rate is also included as a variable. It uses exchange rate volatility to calculate it. It is quantified as the difference in the nominal exchange rate's logarithm's standard deviation. The riskiness of bank lending, however, may be overestimated by investors due to fixed exchange rates, which, if considered in its entirety, may hinder the growth of government bond markets. The term "external debt" refers to unpaid balances owed to non-citizens of a nation and repayable in commodities, services, or money. It is a crucial source of funding that is largely used to supplement domestic funding sources to support developmental requirements. Unmanageable levels of external debt provide the wrong impression to investors that a nation is unable to manage its debt well, which indicates a high chance of default.
The researchers found out the factors that influence the development of the bond market, such as the size of the bond market. Bond size is the value of government, corporate and total bonds in relation to a country's GDP (Musah, Badu and Adjei, 2019). The characteristics that shape bond market development vary from country to country. Economic size, natural openness, economic level, interest rate, banking system size, and Bond market development is primarily influenced by factors such as interest rate volatility, banking concentration, regulatory enforcement, legal system traditions, law and order, corporate governance and transparency, and exchange currency volatility. A portfolio of financial assets that provide external financing, like the bond market, includes the size of the banking system. Their contribution, however, cannot be disregarded. The study is necessary to ascertain the extent and

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direction of the banking sector's contribution to the bond market in a country, even if effective project financing necessitates the combination of both financial sources. When compared to the cost advantages of debt instruments, bank loans have higher intermediation costs due to branch networks and required capital. Thus, blue-chip companies will tend to use the debt market to save money efficiently (Musah, Badu and Adjei, 2019). From an explanatory variable's perspective, the size of the government bond market is critical to the development of the corporate bond market, and the school of thought holds that the corporate bond market precedes a well-developed government bond market (Musah, Badu and Adjei, 2019). However, the crowding effect may have an impact on corporate bonds in some nations due to liquidity pressure in the corporate bond market as a result of low-interest rates on government bonds. Although it can be used to gauge how much government bonds affect the performance of the corporate bond market, there are other factors to take into account as well. Economic size, which is determined using the natural log of GDP, is frequently referred to as the size of the economy or of a country. (Aman, Isa and Naim, 2020). Further, the bond market developments show that a large economy can attract large amounts of capital, resulting in more bond financing, whereas a small economy tends to attract less bond financing. Further, money supply (M2) as a percentage of GDP is a measure of a country's liquidity. Broad money refers to all available cash in an economy, whether it's on hand, outside the bank, in the bank, or in demand deposits (Aman, Isa and Naim, 2020). An increase in the M2 to GDP ratio is predicted to boost investment opportunities in the capital market, particularly in bonds, assuming that there is a high level of knowledge. Bond market development is predicted to be influenced by the money supply as a percentage of GDP Ahwireng-Obeng, S. A. and Ahwireng-Obeng, F. (2020).

Aman, Isa and Naim, (2020) stated macroeconomic and financial aspects' significance for the growth of the bond market was identified. According to the findings, a bond market's growth is positively connected with a number of elements, including economic size, a supportive institutional environment, stable currency rates, and a competitive banking sector (Aman, Isa and Naim, 2020). Furthermore, it is discovered that the bond market and a large fiscal balance are inversely connected. A later study also found a positive relationship between bonds and exports of goods and services. This is so that export-driven economies can draw in investment.
According to (Kubiczek, 2020) corporate bonds are an essential element of the modern financial industry. Thus, a company's growth, ongoing operations, and debt restructuring can all be financed with the help of corporate bond issues.

2.1.2. Dynamic relationship between the stock market and bond market

According to (Chen, Q., Chen, D. and Gong, Y. 2012) the securities market is a system that can be influenced by information and other sorts of policy. Due to market contacts, information is sent and exchanged between various markets, which results in a complex and varied influence pattern on the securities markets. Additionally, different information shocks have an impact on how volatile returns are in the bond and stock markets. It is beneficial to comprehend how the bond and stock markets are

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related to one another. The bond sectors and the stock sector have an asymmetrical relationship. According to the research of certain domestic experts, the interplay between the two markets affects both the rate of return's erratic behavior and the details that are provided by the level of return. The degree of leverage in the stock market is quickly impacted by general information from the bond market. The number of returns in the bond market can be affected by private equity market information across markets. Additionally, there are specific peculiarities in the ways that various sources of information affect both markets' returns and trade activity. For the securities market to remain stable, shock volatilities of both public and private information must be managed and smoothed off.

According to Ilmanen (2003), there is a change from a positive to a negative correlation between equities and bonds. The two main asset classes have had an unsteady relationship. This study looked at how responsive the bond and stock markets were to alterations in monetary policy, volatility, inflation, and the business cycle. Decoupling incurs when volatility shocks and economic growth drive stock and bond values in different directions. The degree of inflation is essential as equities and bonds have a positive correlation with discount rates at high inflation rates. Thus, when growth is unpredictable and inflation is low, the discount rates will be less volatile, which reduces the link between stocks and bonds.

It is commonly known that the long-term Earnings on bonds and stocks have a minor positive connection. The link between stock and bond returns is highly time-variable in the near term, with extended periods of negative correlation (Ilmanen, 2003). This research shows that the future correlation between stock and bond returns has a negative connection with our uncertainty assessments. Bond returns typically outperform stock returns at times when the Volatility Index (VIX) rises (declines) and when unexpectedly high (low) stock turnover occurs (Ilmanen, 2003). Overall, the cross-market pricing effects of that stock market volatility have a substantial impact on how combined stock-bond prices are determined. Financial applications that must comprehend and predict conclusions between stock and bond gains may find that Stock turnover and error variance are useful (Connolly et al., 2005).

2.2. *Empirical Review*

According to past studies, the most essential and crucial determinants of the entire bond market size, however, are perceived to be bank size, money supply, and exterior debt (Maush, Badu and Adjei, 2019). The panel Granger causality test's strongest result is that the long-term drivers of economic growth are inflation, real interest rates, stock market expansion, and bond market expansion (Pradhan et al., 2018). Exports, fiscal balance, GDP at PPP, domestic and foreign debt, and inflation are significant economic factors that influence the growth of the sovereign bond market. The connection is favorable in the first two categories but negative in the sample, and central government debt is not significant across any sample Ahwireng-Obeng, S. A. and Ahwireng-Obeng, F. (2020). Taguchi and Hiroyuki, (2019), imply that a reduction in global risk aversion will cause intra-euro area bond rate differentials to

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shrink. The crises' various effects on the population of Member States. However, monetary resources and investors' anticipated increased risk awareness following the crisis could keep Compared to before the crisis, government bond yield spreads are now wider (Barrios et al., 2009).

Economic growth is favorably impacted by government bond capitalization, trade openness, and inflation, but negatively impacted by corporation bond capitalization and domestic private-sector credit. (Maush, Badu and Adjei, 2019). The structure of the market itself continues to be a barrier to the increased capacity of the corporate bond market in India, despite steady growth. On the overall demand and participation in the corporate debt market, the cause-effect of low liquidity and weak rating systems by rating agencies has not been properly addressed. Demand will be increased by institutional investors' subscriptions to corporate bonds as part of their regulated investments, which will be based on accurate credit profiling (Barrios et al., 2009). Although India has made great strides in entering the corporate debt market, it would be very challenging to get past fundamental challenges the economy has due to macroeconomic factors, such as transparency, technology, and depth of the capital markets (Thukral, Sridhar and Joshi, 2015).

Though there are considerable disparities between nations at comparable levels of development. An established financial market's corporate bond market is a critical aspect, and it has a strong bond with per-capita GDP. Macroeconomic growth and stability are prerequisites to expanding the bond markets as there are tax policies that are fair to investors. The establishment of credit rating systems, efficient audits, and a suitable regulatory architecture are all required at the "industry" level. (Sprcic & Wilson, 2007) Global economies recognized the importance of having dynamic financial markets and strong bond markets for making them more resistant to economic crises. Due to the necessity for long-term funding, both the governmental and business sectors have started issuing bond securities more frequently. This study discovered the progress of the bond market is favorably and significantly influenced by economic size, government spending, stock markets, banking sector development, exports of goods and services, and current account balance. The state of the economy, however, has a detrimental impact on bond markets (Aman Isa and Sun, 2020).

Factors that affect the Asian developing country's bond market have been thoroughly explored and analyzed in the literature review. The financial system is very important for the economic development of any country. Bond is a major part of the financial system and bond financing is a highly practical way for both government and enterprises to raise money. (Maush, Badu and Adjei, 2019). The Bond market development contributes to the economic development of any economy. Ahwireng-Obeng, S. A. and Ahwireng-Obeng, F. (2020) and Bhattacharya and Nath (2011) identified factors that affect bond market development in various regions such as bond market size, money supply, inflation, economic size, banking size, and interest rate spread. However, the current study focuses on examining factors affecting bond market development in Asian Developing countries and investigating the connection

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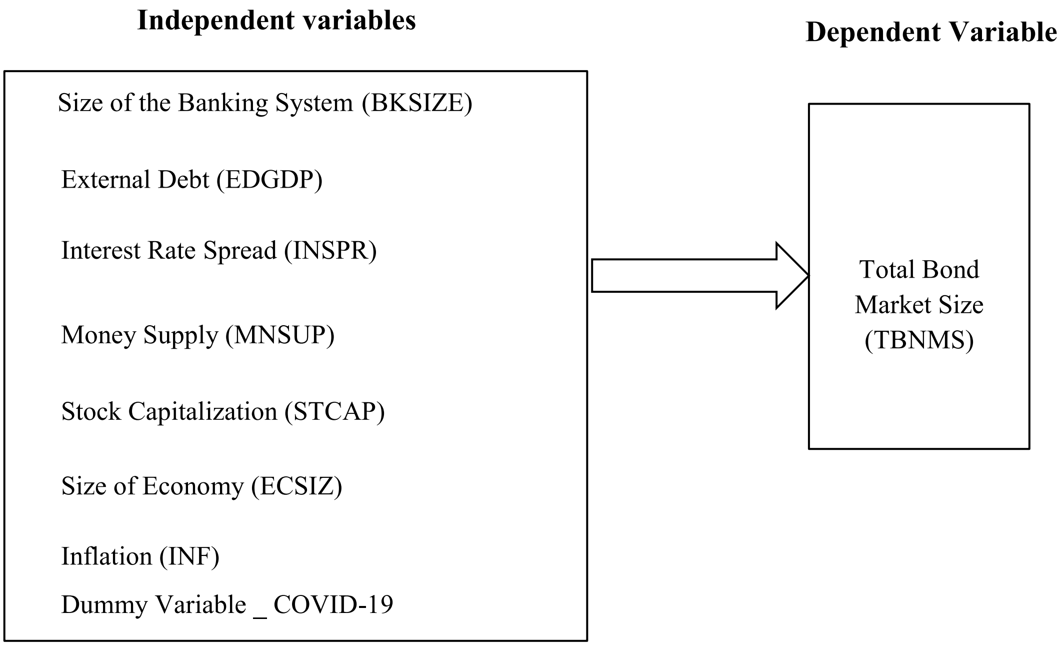
between the earlier claims and earlier researchers' conclusions. The questions raised by the research would be addressed and carefully examined.

3. RESEARCH METHODOLOGY

This research is a quantitative study that follows a deductive approach. In this study, the research logic was identified by using existing empirical studies and testing the factors affecting bond market development in Asian developing countries. Therefore, ten Asian developing countries (China, Philippines, India, Turkey, Thailand, Korean Republic (South Korea), Malaysia, Bangladesh, Cambodia, and Korean Demographic People's Republic) which are listed under the United Nations Conference on Trade and Development (UNCTAD) is considered as the study population. Out of that Seven Asian developing countries (China, India, Turkey, Thailand, South Korea, Philippines, and Malaysia) are selected as the sample for the study due to the limitations of data availability. The sample period is 12 years from 2010 to 2021 and annual data is collected from the secondary sources of the World bank website.

The bond market development depends on the following independent variables namely, the size of the banking system, external debt, interest rate spread, money supply, stock capitalization, size of the economy, inflation, and the dummy variable of COVID-19. The dependent variable is the Total Bond Market Size.



Source: Author Constructed

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Figure 1: Conceptual Framework

Table 1: Operationalization

Variable	Measurement item	Definition	Source
Dependent	Total Bond Market Size (TBNMS)	The ratio of Total Bonds as a Percentage of GDP	(Maush, Badu and Adjei, 2019)
Independent	Size of the Banking System (BKSIZE)	Domestic Credit by Banks as a Percentage of GDP	(Maush, Badu and Adjei, 2019)
	External Debt (EDGDP)	External Debt as a Percentage of GDP	(Maush, Badu and Adjei, 2019)
	Interest Rate Spread (INSPR)	Difference between Lending Rate and Deposit Rate	(Maush, Badu and Adjei, 2019)
	Money supply (MNSUP)	Money Supply (M2) as Percentage of GDP	(Maush, Badu and Adjei, 2019)
	Stock Capitalization (STCAP)	Total Equity Capitalization as a Percentage of GDP	(Maush, Badu and Adjei, 2019)
	Size of Economy (ECSIZ)	Log of GDP	(Maush, Badu and Adjei, 2019)
	Inflation	Inflation as a percentage of GDP deflator	Ahwireng-Obeng, S. A. and Ahwireng-Obeng, F. (2020).
	Covid-19	Before Covid-19 equal to zero During Covid-19 equal to one	

Source: Author Constructed

Based on the research design, the following hypotheses are formulated to empirically analyze the factors affecting bond market development in Asian developing countries.

H1 – There is a significant impact of the Size of the Banking system (BKSIZE) on bond market development in Asian developing countries.
H2 – There is a significant impact of External Debt (EDGDP) on bond market development in Asian developing countries.

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H3 – There is a significant impact of Interest Rate Spread (INSPR) on bond market development in Asian developing countries.
H4 – There is a significant impact of Money supply (MNSUP) on bond market development in Asian developing countries.
H5 – There is a significant impact of Stock Capitalization (STCAP) on bond market development in Asian developing countries.
H6 – There is a significant impact of Size of the Economy (ECSIZ) on bond market development in Asian developing countries.
Ha 7 – There is a significant impact of Inflation (INF) on bond market development in Asian developing countries.

The study incorporates Pooled OLS regression according to the results of the Lagrange Multiplier (LM) test and used STATA statistical software for analysis.

The initial model (model 1) was derived to study factors affecting bond market development in Asian developing countries.

$$TBNMS_{it} = \alpha i + \beta_1 BKSIZ_{it} + \beta_2 EDGD_{it} + \beta_3 INSPR_{it} + \beta_4 MNSUP_{it} + \beta_5 STCAP_{it} + \beta_6 ECSIZ_{it} + \beta_7 INF_{it} + \mu_{it} \text{ --- } (1)$$

Where BKSIZ is the size of the banking system, EDGP is external debt, INSPR is interest rate spread, MNSUP is money supply, STCAP is stock capitalization ECSIZ is economic size and INF is inflation. Further, as the COVID-19 pandemic affected the world economy during the 2020-2021 period, Model 2 was developed incorporating COVID-19 as a dummy variable. Model 2 is shown below.

$$TBNMS_{it} = \alpha i + \beta_1 BKSIZ_{it} + \beta_2 EDGD_{it} + \beta_3 INSPR_{it} + \beta_4 MNSUP_{it} + \beta_5 STCAP_{it} + \beta_6 ECSIZ_{it} + \beta_7 INF_{it} + \beta_8 COVIDD_{it} + \mu_{it} \text{ ------------------------------ } (2)$$

4. RESULTS AND DISCUSSION

The normality of the Shapiro-Wilki Test was used to test the normality of the Dependent variable. As per the results, the probability value is less than 0.05 which indicates that the data set is not normally distributed. Thus, the outliers were identified using extremes tests and the data were cleaned using Winsorizing to make the data normally distributed.

Table 1: Shapiro Wilki-test Results

Variable	Observation	W	V	Z	Prob>z
Total Bond Market Size (TBMS)	84	0.90974	6.449	4.095	0.00002

Source: STATA Output

Multiple regression analysis was conducted to examine the factors affecting bond market development in Asian developing countries. As the Hausman test results generated a probability value of 0.7494 (greater than 0.05) the random effect model was selected. Further, the Lagrange Multiplier (LM) test results generated a

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probability value equal to 1.000 which indicates that pooled OLS model is more suitable than the Random effect model.

Table 2: Pooled OLS regression results

Independent variables	Estimates (1)	Robust Standard errors (2)	t-values
Banking Size	0.5458***	0.1447	3.77
External debt	-0.1880	0.3216	-0.58
Interest rate spread	0.0196*	0.0100	1.95
Money supply	-0.8356**	0.2246	-3.72
Stock Capitalization	0.05215	0.2784	0.19
Economic Size	0.1104	0.0641	1.72
Inflation	-0.0407***	0.0106	-3.82
COVID-19	0.1504	0.0881	1.71
Constant	-2.1268	1.8656	-1.14
P-value	0.0000		
Adj-R-squared	0.4151		
R-squared	0.4715		

*[This table reports coefficients, standard errors, and t-values from the estimations in columns (1), (2), and (3) respectively. *, **, *** denote statistical significance at the 10%, 5% and 1% level, respectively.]*

Source: STATA Output

Table 02 output indicates that the overall model is statistically significant. According to R-squared, 47% of the dependent variable (Bond Market Development) is explained by the independent variables. Adjusted r squared indicates 41.5% accurately reported data. According to the results, Banking Size and Inflation are significant at a 1% level. The money supply is significant at the 5% level. The interest rate spread is significant at the 10% level. The external debt, Stock capitalization, economic size, COVID-19, and constants are not significant according to the results. Those variables' p-value is greater than 0.05 and 0.1.

According to the results obtained by regression analysis, the statistical model can be defined as,

$$TBNMS_{it} = -2.127_{i} + 0.5458BKSIZ_{it} + 0.0196INSPR_{it} - 0.8356MNSUP_{it} - 0.0407INF_{it} + 0.2420\mu_{it} \quad (3)$$

When Banking size, external debt, interest rate spread, money supply, stock capitalization, economic size, inflation, and COVID-19 are held constant, bond market development is equal to -2.127. When banking size changed by 1% bond market size changed by nearly 0.55%, when external debt changed by 1% bond market size changed by nearly 0.19%, when the interest rate spread changed by 1%, the bond market size changed by 0.020%, when money supply changed by 1% bond

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market size change 0.84%. Further, when stock capitalization changes by 1%, bond market size changed by 0.052%., Moreover when economic size changed by 1%, bond market size changed by 0.11%, and the inflation change in 1unit lead bond market size to change by 0.04%. Further, the size of the banking system, and interest rate have a significant positive impact on the bond market development. However, there is a significantly negative impact of money supply and inflation on the bond market development.

The null hypotheses of the size of the banking system, interest rate spread, money supply, and inflation are rejected. Therefore, it can be concluded that bank size, interest rate, money supply and inflation affect the bond market development in Asian developing countries. Whereas, the null hypotheses of external debt, stock capitalization, economic size, and COVID-19 are accepted. This indicates that external debt, inflation, economic size and COVID-19 do not affect the bond market development in Asian developing countries.

4.1. Impact of COVID-19 Bond market Development.

4.1.1. Before COVID-19

Table 3: OLS results Before the COVID-19

Independent variables	Estimates (1)	Standard errors (2)	t-values
Banking Size	.7282763***	.2062376	3.53
External debt	-.2395158	.2588987	-0.93
Interest rate spread	.0350009***	.0093934	3.73
Money supply	-1.101576***	.2852315	-3.86
Stock Capitalization	-.0292873	.1106365	-0.26
Economic Size	.1304004	.0870026	1.50
Inflation	-.0332655***	.0112079	-2.97
Constant	-2.516029	2.434077	-1.03
P-value	0.0000		
R-squared	0.5239		
Adj-R-squared	0.4701		

*[This table reports coefficients, standard errors, and t-values from the estimations in columns (1), (2) and (3) respectively. *, **, *** denote statistical significance at the 10%, 5% and 1% level, respectively.]*

Source: STATA Output

The overall model is significant as the p-value is below 0.05. According to R-squared, 52.4% of the dependent variable (bond market development) is explained by the independent variables. The banking size, money supply, interest rate spread, and inflation are significant at the 10%, 5%, and 1% levels. Other variables of external debt, stock capitalization, economic size, and constant not significant. Thus, it can be

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concluded that the size of the banking system and interest rate spread has a significant positive impact on bond market development in Asian developing countries before the COVID-19 period. Money supply and inflation inversely affect bond market development before COVID-19. Other factors do not significantly impact Bond market development before the COVID-19 period.

4.1.2. During COVID-19

Table 4: OLS Results During COVID-19

Independent variables	Estimates (1)	Standard errors (2)	t-values
Banking Size	0.09678	0.6189	1.56
External debt	1.3584	1.1801	1.15
Interest rate spread	-0.0191	0.0448	-0.43
Money supply	-1.580	1.0464	-1.51
Stock Capitalization	0.739	0.4944	1.50
Economic Size	0.530	0.3559	1.50
Inflation	-0.0190	0.0281	-0.66
Constant	-14.69		
P-value	0.3796		
R-squared	0.6042		
Adj R-squared	0.1423		

*[This table reports coefficients, standard errors, and t-values from the estimations in columns (1), (2), and (3) respectively. *, **, *** denote statistical significance at the 10%, 5% and 1% level, respectively.]*

Source: STATA Output

The overall model is insignificant. The probability value is greater than 5% and 10%. The bond market development can be explained by 14.23% with the independent variables which represent bond market development during the COVID-19 pandemic. The overall model and the individual variables are statistically insignificant. Thus, it can be concluded that all variables do not have any impact on bond market development during the COVID-19 pandemic.

There are times when the findings of the present study are consistent with previous literature and times when they contradict. As per the current study, the money supply has a significantly negative impact on Asian developing countries. According to Musah et al (2019), it is a significant negative impact on Ghana and stock capitalization does not significant impact on Asian developing countries and Ghana. Some works of literature are contradictory to the findings of this study. The size of

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the banking system is a significant positive impact on Asian developing countries but in Ghana, it is a significant negative impact on the bond market. Interest rate spread is a significant positive impact in the current study but it is insignificant in Ghana. Economic size is a significant positive impact on the bond market in Ghana but it does not significantly impact Asian developing countries (Maush, Badu and Adjei, 2019)

5. CONCLUSION

According to the study, Bond market development is very important to the financial system of Asian developing countries. As a grant, this paper was conducted to recognize the elements affecting the growth of the bond market in developing countries in Asia and to understand the relationship between those factors. In the case of Asia, the size of the banking system is a key factor impacting bond market development and it is positively related to bond market development. Interest rate spread impact bond market development in Asian developing countries and it is positively related to bond market development. The money supply is a key factor influencing bond market development and it is inversely related to bond market growth. Another key factor influencing bond market development is inflation in Asia. It is negatively related to bond market growth.

The following are implications when considering the growth of bond markets in developing countries in Asia. The size of the banking system is the key factor affecting bond market development. It implies domestic credit provided by banking system changes affect bond market development. Interest rate spread is also a key factor affecting bond market development. Policymakers and decision-makers should concern about the lending rate and deposit rates. The M2 money supply implies changes in money supply cause changes in bond market development. Inflation is also a key factor thinks about bond market development. When thinking about bond market development, it is important to think about inflation

The study used only secondary data and no primary data is used. Because cannot access relevant people, organizations, or documents directly. Only very common variables have been used in the study. These things are the limitations of the study. If more variables can be added in future studies, the way the variables are measured can be changed, increase sample size, and incorporated with behavioral finance factors such as behavioral biases of the investors. It will improve the significance of the study.

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