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# Research on the Corporate Bond Risk Factors

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**Abstract.** The global bond market is greater than the global equity market meanwhile it grows gradually in recent years. Issuing corporate bonds is an ideal channel for enterprises to raise funds in the course of COVID-19 and also provides resilience in the market. Moody's, Standard & Poor's and Fitch are well-known global credit rating agencies and suggest investors purchasing investment-grade bonds for reasonable risks and returns. But local credit rating agencies have limited capacities to appraise local bonds. In the COVID-19 crisis, widen yield spreads represent likelihood of default which can be a measure of credit risk. Besides, government interventions (i.e., Quantitative Easing Program) can effectively eliminate credit risks and Confucian culture is a factor in assessing credit risks of corporate bonds. As for liquidity risk, Chinese bond market is less liquid than the US bond market and financial bonds are the most liquid in the Chinese market. The liquidity risk is caused by inaccurate information and market risk tolerance whereas market risk tolerance integrates credit and liquidity, the main measurement of liquidity risk is transaction cost which means that higher transaction cost can impede liquidity in the bond market. Finally, market risk comprises of COVID-19 pandemic, market design and biodiversity risk. The epidemic tightens the financial condition of developing countries and depreciates the currency of the bond market which raises term structure of interest rate up. A well-designed financial market system can help stabilize fluctuations during financial crisis. Besides, biodiversity risk is relevant to the operation apartment of companies.

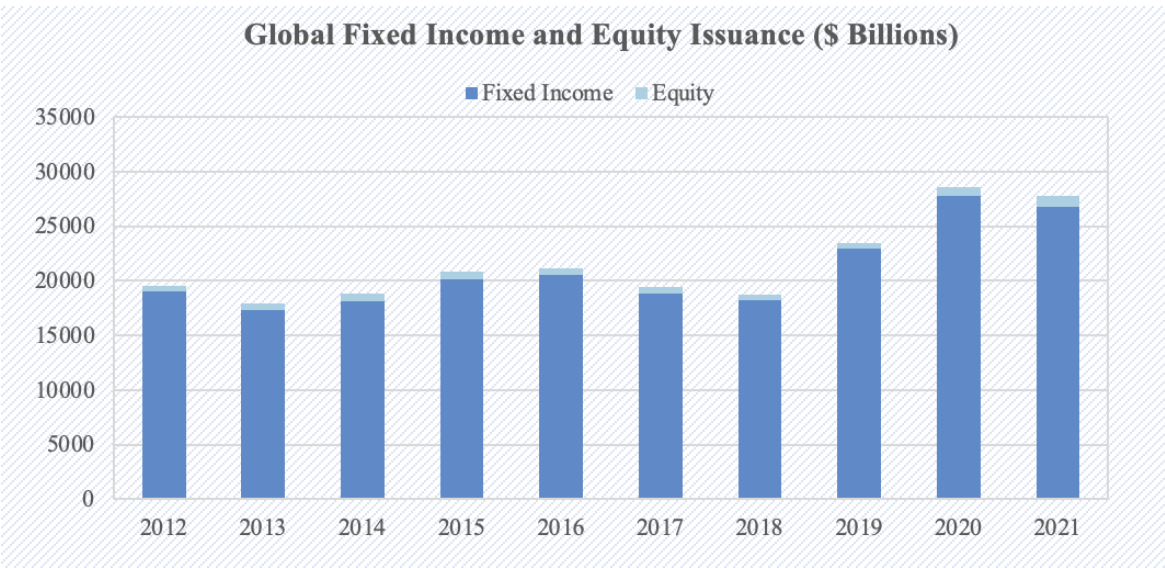
**Keywords:** Corporate bond; credit risk; liquidity risk; market risk.

## 1. Introduction

Varieties of bonds in the financial market can be divided into four major classifications in the criterion of bonds issuers as Municipal Bonds, Government Bonds, Corporate Bonds and Government Agency Bonds. Research by Zundert and Driessen supports that firms can issue bonds on the public capital market for financing their business operation and activities [1]. The bond is called a corporate bond. Government bonds are backed up by governments that can raise funds to correct budget shortfalls and finance capital projects through sets of bond issuance [2]. The development of the bond market has become significant. Volume of global fixed-income issuance is greater than the global equity market and has an upward trend in the near years, increasing from 18.2 trillion dollars in 2018 to 26.8 trillion dollars in 2021, as Figure 1 (source: SIFMA Securities Industry and Financial Market Association) shown. It can be clear found from Figure 2 (source: SIFMA Securities Industry and Financial Market Association) that the US occupies the largest proportion of global fixed income outstanding around 40% and the Chinese fixed income market capitalization has expanded sharply to 17.2% in 2021. The bond market has occupied a dominant position in European Capital Market and official statistics depict that sovereign bonds have 50% of total market capitalization, followed by 40% in equity and 10% in corporate bonds; conversely, the corporate bond in the U.S. has expanded smoothly from 6% to 10% of total market capitalization in the past twenty years [3].

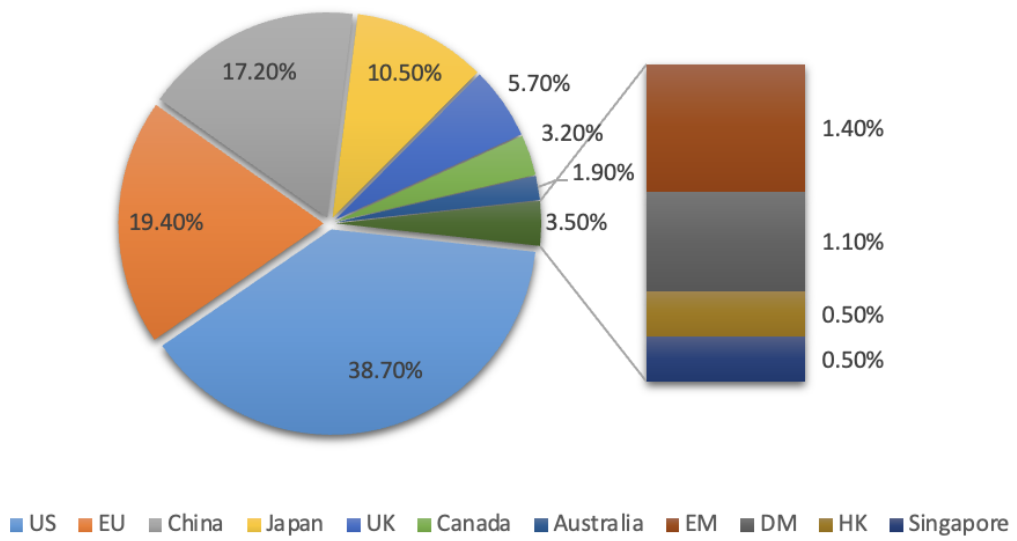
According to Becker and Benmelech's paper, it describes that in the course of the COVID-19 pandemic, the amount of corporate bond issuance in the U.S. reached exceeded 300 billion dollars in the first half of 2020, twice higher as the preceding year whereas loan issuance was not prevalent as bonds [4]. It means that corporate bonds can be regarded as the best method in comparison with bank loans for enterprises to gratify the requirement of funding during the pandemic and better credit quality makes corporate bonds more resilient in the crisis. In the Chinese bond market, Amstad and He argue that China has paid enormous efforts into developing the bond market in the past twenty years which is recognized as an indispensable part of financial reform and official statistics represent

that the proportion of bond market capitalization in GDP has increased to 90% in 2017 compared with 35% in 2008 [5].



**Fig. 1** Global income and equity issuance during 2012-2021  
(Photo credit: Original)

**Global Fixed-Income Outstanding 2021 (Total: \$126.9 Trillion)**



**Fig. 2** Global fixed-income outstanding 2021  
(Photo credit: Original)

The bond market can boost economic growth and consolidate financial integration. According to Nneka et al.’s research, it explains that there is a positive causal relationship between government bond capitalization and economic growth in developing countries disclosing that one unit increase in government bond market capitalization can bring 1.85% of growth in the economy [6]. Additionally, Stoupos and Kiohos (2022) argued that bond market integration is a vital factor of financial integration in the European Union and that deeper financial integration can stimulate higher economic growth, evidenced by integration of bonds between the EU non-euro bond market and the Euro Big-5 economics is heterogeneous and dissimilar [7].

Thus, a well-established financial system and financial institutions typically for bond market development can facilitate more investments from investors and provides convenient ways of raising

capital for different entities to financing activities [8]. In return, investments and business activity stimulate economic growth. According to Amstad and He (2020), the stable and rapid growth of the Chinese bond market brings enormous advantages to economic agents in the Chinese economy since the bond market helps the central bank implement monetary policies and conduct open market operations [5]. The paper focuses on analyzing bond markets based on the corporate bond market and examine corporate bonds pricing determinants: credit risk, liquidity risk and market risk in the following sections.

## 2. Credit Risk

Credit risk measures the likelihood of default that issuers cannot fulfil obligations for returning principals and interests to investors due to insolvent financial status. Major worldwide credit rating agencies are Moody's, Standard & Poor's and Fitch. Credit rating can assist to value the creditworthiness of bond issuers by discerning whether they are obligated to pay out interest payments and principal before maturities. The credit rating agencies use alphabetical grades for appraising credit risks and the highest credit rating is AAA otherwise D is apt to default. Besides, the investment-grade bond is rated as BBB-/Baa3 or higher and regarded as the best choice for investors to be involved in the bond market as those bonds have reasonable risks and stable yields.

According to Kawai (2019), it interprets that global rating agencies can offer valuable ratings for higher-quality bond issuers on the principle of 'global scale' [9]. Meanwhile, it can identify risks among sovereign and non-sovereign issuers, but it cannot give any advice on numerous local small corporate bonds which means that local credit rating agencies solely can rate the bonds in 'national scale' with limited rating capacities and different rating standards. It means that global credit rating agencies cannot help rate the credit quality of local bonds which only can be assessed by local rating agencies. But local rating agencies are limited to rating some bonds due to lacked technical capacities and different standards of rating methods. Investors should be aware that rating standards between global rating agencies and local rating agencies are inconsistent to avoid losses in choosing bonds.

According to Nozawa and Qiu (2021), it can be found that the bonds market can be segmented with respect to credit ratings and initials reactions of corporate bonds with distinctive credit ratings to announcements of US Federal corporate bonds purchase programs are dissimilar which has demonstrated that credit spreads of those bonds increased at peak in COVID-19 pandemic and credit spreads on High Yield bonds did not decrease in the first announcement whereas investment grade bonds did afterwards yield spreads of the bonds fell after the second announcement [10]. Credit spreads are yield differences between treasury bonds and corporate bonds with the same maturity which is a measure of default risk. Treasury bond is riskless and can be the benchmark for assessing the credit gap between corporate bonds. When the credit spread is wider, it means that corporate bonds might face more uncertainties and are prone to default so the bonds should compensate investors higher risk premiums leading to higher yields. The COVID-19 pandemic brings fluctuations in US financial market even the global market and contributes to higher credit spreads which persuade the US government to interfere in the bond market via quantitative easing programs such as Corporate Bond Purchasing Programs [10]. The program benefits investors and bond issuers for the reasons that the evidence reveals that after governments purchase bonds back, credit spreads will be narrow meaning that the possibilities of default on those bonds tend to be mitigated and dwindled.

A study conducted by Zhai and Tang (2022) illustrates that locations of corporations' headquarters are filled with a Confucian atmosphere measured by the density of Jinshi in Ming and Qing Dynasties and corporate bonds issued by those companies would have better credit quality, meaning that Confucian culture can be seen as soft information, helpful for improving Chinese bond market efficiency [11]. Thus, it has a positive relationship between bonds' credit rating and Confucian culture which means that a company located in a city with a higher density of Jinshi in the Ming and Qing Dynasties is more likely to issue corporate bonds with a higher credit rating. Confucian culture, one

of Chinese traditional culture, is of help regulate managers' behaviors and foster awareness of repayment obligation.

In sum, the global reputable rating agencies include Moody's, Standard & Poor's and Fitch and they help evaluate high-credit quality bond issuers through credit rating. Investors are suggested to purchase investment-grade bonds with rational risks and a credit rating is BBB-/Baa3 or higher. Nevertheless, some issues still exist in local credit rating agencies that limited capacities and variations in credit rating standards may diverge from global credit rating agencies so that investors are likely to be lost in small-size bond selections. Additionally, credit spread is another criterion of default risks and becomes greater when bonds' default risks are higher. The COVID-19 pandemic damages the economy and corporate bonds credit spreads climbed up so that bond issuers have more possibilities of default. Thus, governments should take actions that can effectively abridge credit spreads and lower credit risks to a large extent. Moreover, Confucian culture can be a factor result in credit risks meaning that bond issuers who are nurtured by Confucian culture are less likely to default and their corporate bonds' credit spreads are lower.

### **3. Liquidity Risk**

Liquidity risk commonly exists in the bond market and the risk narrate that investors cannot sell or buy financial assets in a certain size at a specified time and price. According to Amstad and He (2020), it describes that financial bonds are the most liquid in the Chinese bond market regarding to turnover ratio with a ratio of 4, followed by government bonds with a turnover ratio of 1.6, and corporate bonds are ranked as the least liquid meanwhile the Chinese bond market is less liquid than the Chinese stock market, which hinders the implementation of monetary policies and makes it difficult to discover prices efficiently [5]. Therefore, Edward et al. (2007) argued that corporations should be aware that whether the corporate bonds market has liquidity before issuing bonds since higher market liquidity can help of lowering costs of capital [12].

Li et al. (2021) points out that declined information accuracy and market risk tolerance as consequences of liquidity risk whereas market risk tolerance establishes a bridge between liquidity and credit illustrating that liquidity risk and credit risk are highly correlated which can lead to a death spiral in the bond market during a financial crisis [13]. Therefore, a correlation between liquidity risk and credit risk is manifest in the bond market and it makes the market more dangerous during a financial crisis. Since the financial crisis lowers market risk tolerance, persuading investors to redeem bonds in a transitory time. At the same time, the crisis weakens operation capacity so it is possible for corporations not to fulfil repayment obligations as a result, liquidity risk hinders redemption of bonds that investors cannot sell bonds back to bond issuers at a specified time. Hence, liquidity risk and credit risk are interconnected in the financial crisis which is the death spiral of the bond market.

According to Diaz and Escribano (2022), it can be found that a 'tightness' indicator is one of the liquidity proxies which measures transaction costs and reveals that higher transaction costs can impede transmissions of bond market leading to lower liquidity in the bond market meanwhile 'tightness' can be the best liquidity proxies among the others 'breadth, depth, immediacy, resilience and tightness' [14]. Transaction costs are related to market transparency which concerns about daily prices of inactive bonds and there is a positive relationship between them meaning that higher market transparency can eliminate transactions costs in trading so some evidence has demonstrated that institutional investors have low transaction costs in a large volume of transactions and the reason is that they are well-informed about bond values based on knowledge so that they have abilities to negotiate better prices on the contrary, it is expensive for retail investors to trade bonds due to higher transaction costs because of less informed on bonds [12]. Corresponding to Sun (2007), it states that among a list of liquidity measures (bid-ask spread, zero-return percentage and Amihud illiquidity factor), zero-return percentage describes the sluggish bonds trading which is the best predictor of liquidity yields and is equipped with a more powerful explanatory in facet of liquidity yield spreads while the indicator is positively related to the yield spreads [15]. It illustrates that a large zero-return

percentage represents lower transactions in bond markets and the bond market is illiquid which can raise yield spreads up.

Liquidity risk is the possibility that investors won't be able to buy or sell a certain percentage of financial assets at the expected time and price. In the Chinese bond market, the worse liquidity type of bond should be corporate bond thus corporations are suggested considering whether the bond market is liquid beforehand releasing bonds which helps reduce the cost of capital. Besides, factors of liquidity risks in the bond market are inaccurate information and lower market risk tolerance which attaches credit and liquidity. 'Tightness' indicator and zero-return percentage are powerful measurements of liquidity risk. 'Tightness' represents transaction costs because of lower market transparency and zero-return percentage measures the frequency of inactive bonds trading.

#### **4. Market Risk**

The COVID-19 pandemic is a challenge that every country should tackle within the past three years as the epidemic not only damages the health system but also impacts on financial market deeply and the depth of influence even overpasses the global financial crisis in 2008. According to Shipalana and O'Riordan (2020), it illustrates that in face of COVID-19, the financial condition of developing countries becomes tighter and depreciation of currency is prone to be terrible which enhances demands of risk-less assets (i.e., Bonds) from investors [16]. Meanwhile, an experiment conducted by Zaremba et al. (2021) shows that infections of COVID-19 influence international sovereign bond markets deeply, especially for the bond yield spread increasing numbers of infections can widen the yield spread which expands term structure of interest rates comprising of multidimensional risks premium [17]. COVID-19 brought more uncertainties and risks to financial markets which triggers higher yield spread including more risk premiums compensated for investors. Market design exerts a determinant part in market stabilization during the COVID-19 epidemic following one instance that trading of corporate bonds is typical in the OTC market but in Israel, investors ought to trade corporate bonds at an exchange which is a centralized trading center, as a consequence, Israeli bond market's trading volume still soared despite the pandemic and cannot be influenced by any interventions [18].

Additionally, some corporate bonds are sensitive to biodiversity risks. Cherief et al. (2022) demonstrated that businesses in industries that are the most detrimental to biodiversity are vulnerable to spreads widen after biodiversity catastrophes as the loss of biodiversity was the third-largest global risk over the following ten years which is considered whether the risk should be classified as a systematic risk, and biodiversity is a resource that may offer opportunities for businesses and human activities [19]. Biodiversity is the foundation of all species on Earth [20]. As an example, IKEA is a retail company located in the Netherlands and its main operation is for selling designed furniture provided by thousands of IKEA's worldwide suppliers and manufacturers such as Vanguard Industrial. It is appear that furniture is made of numerous blocks of wood and the fundamental sources normally come from Amazon Forest. Thus, humanity activities can damage the ecosystem in the forest by cutting down a large number of trees where that forest is the habitat of species which leads to the elimination of species. Although Amazon Forest provides business opportunities to IKEA, the company still faces biodiversity risks that once degradation of the forest becomes serious and its operation capacity will decline which can impact the reputation of the corporation and credit risk is triggered.

The COVID-19 pandemic damages social health system but also ruin the global financial market, indicating that uncertainties in the crisis widen yield spreads and higher risk premiums should be compensated. Market design is the factor of market stabilization meaning that investors can trade corporate bonds at the Israeli exchange as usual in COVID-19 which is a centralized trading center rather than an OTC market in comparison to other countries. Biodiversity risk can be seen as market risk and evidence illustrates that biodiversity disaster can widen yield spreads IKEA can be an example reflecting the importance of biodiversity.

## 5. Conclusion

The bond market can drive economic growth through consolidating financial integration and a well-established financial system can help facilitate more investments among investors. The paper has escorted a critical analysis of the global bond market, especially from the corporate bond market in perspectives of credit, liquidity and market risk. There are mutual empirical findings that liquidity risk and credit risk are the source of the death spiral in financial crisis, the three main risks widen bond yield spreads in COVID-19 and some government interventions such as quantitative easing programs and implicit government guarantees can effectively diminish bonds' risk exposure and lower bonds yield spreads. Biodiversity should be emphasized that loss of biodiversity have huge impacts on reputation of companies and their operation capacities which is regarded as biodiversity risk. Moreover, a limitation of the paper is that it does not accompany with any empirical experiments of credit risk, liquidity risk and market risk since evidence is dependent on other literature. At the same times, some research need to be renewed in the current state because one or two empirical findings are outdated and not directly related to the topic of paper.

In further research, improvements of the paper should cover that it will continue to focus on corporate bond market. Firstly, it plans to explore term structure of interest rates in details from perspective of bond pricing. Secondly, paper will conduct an empirical analysis of bond pricing in a specified country based on main risks: liquidity, credit and market risk. Main methodology is constructing econometrics models, collecting and manipulating datasets meanwhile reaching out empirical findings for proving hypothesis in the end.

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