Bank Efficiency and Bond Markets: Evidence from Asia and the Pacific

Financial intermediation promotes economic growth, creating liquidity and extending credit to facilitate resource allocation and risk sharing.[7] The efficiency of the banking sector is a major concern of regulators and policy makers, and it remains a topical issue in the literature. While most existing empirical studies focus on various factors that affect bank profit and/or cost efficiency, this study adds to the literature by examining how bond market development is related to bank profit and cost efficiency.

Banks are an indirect financing channel that primarily provide credit to the private sector, while bond markets serve as a direct financing channel that provide credit to both the public and private sectors. Bond market development can affect bank efficiency in many aspects. First, bond markets compete with the banking sector not only for loans but also for deposits. Government bonds serve as an alternative risk-free investment vehicle for depositors; therefore, banks need to increase deposit rates to attract more funding. Meanwhile, corporate bond markets provide an alternative source of financing for the private sector, which becomes a potential competitor of banks. Firms with the highest credit quality have the option to tap bond markets for financing via corporate bond issuances. Hence, a large bond market will force banks to improve the efficiency of their asset allocation to maintain profitability and challenge banks' cost efficiency given possible higher funding costs. Second, bond markets offer more investment instruments for banks' asset portfolios. Banks can invest in government bonds and high-rated corporate bonds, thus better managing the liquidity and credit quality of their asset portfolios, albeit at the cost of lower returns. Third, banks can issue corporate bonds to obtain stable financing with the desired maturity, which can mitigate the duration gap between assets and liabilities on banks' balance sheets, albeit with higher funding costs. Fourth, bond markets provide market-based benchmarking for banks to price their loans and deposits. Hence, bond market development affects banks' operation in terms of assets and liability management, as well as liquidity risk management.

While many developing economies' financial systems remain largely bank-centered, recent decades have seen the rapid development of capital markets. Thus, it is important to understand how bond market development is related to the profit and cost efficiencies of commercial banks. This study constructs a sample of commercial banks from 27 economies in Asia and the Pacific from 2004 to 2017 and considers how their efficiency is related to three bond market development indicators: (i) aggregated bond market size as a share of gross domestic product (GDP), (ii) government bond market size as share of GDP, and (iii) corporate bond market size as a share of GDP. In addition to bond market development, a number of other related variables are also considered in this study, including economic, banking-industry, and bank-specific attributes such as GDP growth, inflation, income level, banking sector openness and regulation, bank size, and leverage ratio.
This study utilizes parametric stochastic frontier analysis to estimate bank efficiency. This technique provides unbiased systematic estimates for an unbalanced panel data sample during which bank efficiency can be influenced by country-specific and bank-specific factors, and thus is widely used in cross-economy studies. The dependent variable is bank profit or cost inefficiency; thus, the negative sign of a coefficient will indicate that the variable has a positive impact on bank profit or cost efficiency.

The empirical results are presented in two parts. The first is the effect of overall bond market development. The development of all three bond market types

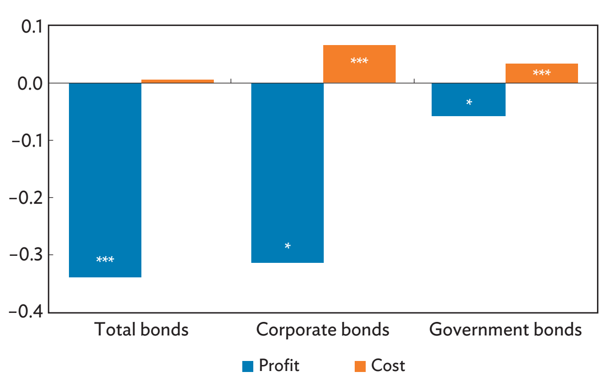
[7] This is shortened version of D. Park, S. Tian, and Q. Wu. 2020. Bank Efficiency and the Bond Markets: Evidence from the Asia and Pacific Region. *Asian Development Bank Economics Working Paper Series*. No. 612. https://www.adb.org/publications/bank-efficiency-bond-markets-asia-pacific.

(i.e., aggregate, corporate, and government) has a positive effect on bank profit efficiency but a negative effect on bank cost efficiency. The results are robust when control variables are introduced. The effect is persistently significant for the total bond market and the government bond market, but not for the corporate bond market. The results indicate that banks are generally more profit-efficient, but less cost-efficient, in an economy with a relatively more developed bond market (**Figure 14**). This finding confirms the competitor role of bond markets. When large clients can tap corporate bond markets for financing, banks are forced to lend to smaller clients by improving asset management skills and profitability. Meanwhile, a larger government bond market means deposit pricing is more market-based, which will increase banks' funding costs. In addition, when banks issue bonds to finance themselves, they also face higher costs. Thus, a developed bond market is associated with lower cost efficiency. Consistent with the relevant literature, the results show that banks are generally more efficient in economies with a higher degree of capital account openness, more constraints on cross-border investment, faster economic growth, a lower inflation rate, and higher income levels. As for bank attributes, larger banks are more profit-efficient but less cost-efficient, and a higher capital ratio reduces (increases) bank profit (cost) efficiency. Banking-industry specific characteristics have a mixed effect on bank efficiency. Less stringent banking entry requirements, higher asset concentration, greater supervisory independence and private monitoring power, and a higher rate of foreign ownership of banks all help to improve bank profit efficiency, while the impacts of these factors on bank cost efficiency are trivial.

The second part of the results looks beyond the level of bond market development and examines the impact of bond market structure on bank profit and cost efficiencies. The result shows that while total bond market development has a positive and significant impact on bank profit efficiency, the share of corporate bonds to total bond market size has a positive but insignificant effect on bank profit efficiency (**Figure 15**). Furthermore, a larger share of local currency (LCY) corporate bonds as share of total LCY bonds is found to significantly improve bank profit efficiency, while the positive and significant impact of total bond market size remains. The structure of the corporate bond market has a mixed effect on bank cost efficiency. The role of total bond market size on banks' cost efficiency remains insignificant, but a larger share of corporate bonds to total bonds shows a significant role in improving banks' cost efficiency. However, when LCY corporate bonds as a share of total LCY bonds is considered in the analysis, total bond market size showed a significant negative impact on bank cost efficiency.

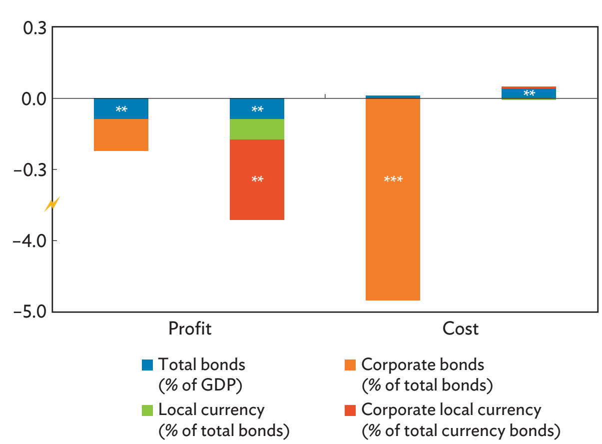
Overall, we find that bond market development has important implications for the banking sector. Bond

Figure 14: Effect of the Level of Bond Market Development on Bank Inefficiency (% of GDP)



GDP = gross domestic product.
Notes: The dependent variable is bank profit (cost) inefficiency. A negative impact indicates improved bank profit (cost) efficiency, while a positive impact indicates reduced bank profit (cost) efficiency. The ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.
Source: Authors' calculations.

Figure 15: Effect of the Aggregate Bond Market Structure on Bank Inefficiency



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Source: Authors' calculations.

markets serve as a competitor for bank depositors and borrowers, an investment asset pool with government bonds and corporate bonds as portfolio assets, and an alternative financing vehicle in the form of bank bond issuances. They also offer asset and liability pricing benchmarks. On the assets end, the competition and asset pool effects benefit banks with higher profit efficiency as banks improve asset allocation and build capacity to extend more loans to smaller clients that do not have access to capital markets that could increase returns on assets. Meanwhile, a larger bond market lowers banks' overall cost efficiency because government bonds compete for depositors and force banks to raise costs on deposits, and bank bond issuance also comes with higher costs than deposits. The structure of the bond market also matters to bank efficiency as government bonds and corporate bonds have different implications for banks.

The findings of this paper have important policy implications for economies with a very low level of bond market development, or those without a functioning bond market, and for economies with a high level of bond market development but an unbalanced bond market structure. The bond market works like a double-edged sword for bank management. On the asset side, banks can invest in the corporate bond market to diversify risk in their asset portfolios, but they also face competition from the corporate bond market in that some clients will use direct financing from the bond market. On the liability side, banks may obtain stable funding from the corporate bond market, but they need to pay higher financing costs as government bonds compete for deposits and lead to higher funding costs for bank bond financing. Policy makers need to ensure a well-functioning and balanced bond market to better finance economic growth and development.