The Impact of Interest and Credit Rate Policies and Macroeconomic Factors on Non-Performing Loans in Singapore

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Abstract

The objective of this research is just to investigate the effect of variables on credit, inflation, interest rates, exchange rates, and non-performing loans. we using secondary data from January 2000 to 2020 in Singapore. Data were using the analysis to ascertain the relationship between the Autoregressive Distributed Lag (ARDL). We found that each approved loan carries the risk of non-performing loans. The interest rates rising increases the risk of defaulted loans. However, inflation has no effect on non-performing loans in Singapore. However, the exchange rate actually has a significant negative relationship to non-performing loans where the stronger the Singapore currency reduces the risk of non-performing loans in Singapore

Keyword : Interest,Credit Rate Policies, Macroeconomic Factors, Non-Performing Loan
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Background

The bank lending market in Singapore has close linked each to related various financial market segments Relating to the real economy sector. To this reason, the formation of bank lending rates is a difficult process, and it, together and with Bank of Singapore's monetary policy, is impacted either by price of raising funds by banks, the costs, and risks involved in spreading them competition for borrowers and depositors in deposit and lending rates , as well as the present inflation rate and forecasts for inflation (Shahzad, Bouri, Kristoufek, & Saeed, 2021). To analyze a particular bank's pricing process, should conduct a thorough study of its reporting to identify specific factors affecting the interest rates on loans and deposits it offers, which go beyond the Main Directions of Monetary Policy (Zahariev, Angelov, & Zarkova, 2022).

Since loans are a bank's primary asset, interest rates on loans must cover the bank's subsequent fundraising costs, individual deposit rates, the main types of bank interest obligations, are used as indicators, any extra expenses related to obtaining and managing money (Azmat, Azad, Bhatti, & Ghaffar, 2020). The minimum rates for lending and deposits are different covers the main elements at banking (Brei, Borio, & Gambacorta, 2020 ; Wilantari, Widarni, & Bawono, 2021). Operating costs do not depend much on the duration of the operation, as six-month and six-year loans involve the same costs. At the same time, fees of this type in the In the event of long-term loans, the bank will be able to receive salary from loans much extended as opposed to simple lending, and as a whole, will "finance" the bank less per unit of time. That is case, the involvement from transaction the simple expenses loan interest rates compared to the lengthy period interest percentages (Kelley, Steinberg, McCoy, Pack, & Pepion, 2021).

Running expenses are borne by the entire bank, and that's not possible to identify whether portion of these costs is related to specific operations (Viphindrartin, Wilantari, & Bawono,

2022). To describe the rate of interest spread on loans and injects, this is presumable that it the typical maturity brief term finance transactions is three-fourths, & that at the lengthy period banking is 3-year period (Eidestedt, Forsman, & Ünlü, 2020). At the same time, that is considered that it the unqualified sum of expenses for immediate operations is lower more the same indicator for lengthy period operations. In addition to current activity fees, banks also have special fees associated with deposit operation commissions. In addition, a bank withdrawing funds for Reserves are needed to reserve a portion the of withdrawn finances into a Mandatory Savings Finance (Angori, Aristei, & Gallo, 2019).

Lending is also closely related to bank acceptance risk of credit, risk associated with the loan won't give back the borrowed money or give them back an incomplete amount (Prabowo, 2017 ; Prabowo, Sasongko, & Damayanti, 2022). To avoid suffering expenditures, the lender , and a costs stated above include the credit risk premium in the credit mortgage cost, so that the price borne by creditworthy debtors can cover losses caused by default of creditworthy debtors. making loans (particularly huge lending companies), financial institutions thoroughly evaluate the solvency at borrowing candidates, then if making loans, they too set unsecured loan terms, which is impossible to fully bear (Pahnecke & Bohoslavsky, 2021). Significant deterioration in credit approval eligibility may occur for reasons beyond its control, for example, due to the bankruptcy of the other party (Dörr, Licht, & Murmann, 2022). It is difficult to determine the average risk premium value that is specific to the financial industry because Every bank assesses it differently (Spears, 2019). To purpose of deciphering the spread of lending rates for deposits, the quote from most readily available credit default swap (CDS) is served as an indicator component of the risk premium, since the degree of the creditor danger of funding for non-financial organizations not be less than the risk of a negative loan rating (Fu, Li, & Molyneux, 2021).

The difference among lending and lending rate are the bank's generate income. Increasing lending requires, banks must comply with a number of "margin of safety" with regard to equity, which banks replenish in opposition to profits. For launch novel branch or new products, banks require investment capital that also come from profits (Chioma, Okoye, Chidume, & Nnenna, 2021).

the wider the difference among lending and rates of deposits, than profit the more possibilities a commercial bank receives, the more revenue it has to increase lending (Song, Yang, & Tao, 2020). However, the specified spread cannot be arbitrary. loan requests, and supply of reserves coming by non-financial sources, reserves coming by non-financial sources, doesn't permit banks to establish loan interest rates that are too tall or deposit interest rates that are too lowly, on the other hand, prospective bank customers will prefer loans that are a relatively cheaper or profitable investment (Whited, Wu, & Xiao, 2021). As a result, In recent years, the spread of lending & financing costs have largely remained consistent with the minimum economically justified levels, which has led to positive profits for banks (Nguyen, & Dang, 2020).

Banks are still very careful in choosing debtors out of concern for raising the dangerous area of the loan. To this case, the exact degree of credit danger expanded to a select group of debtors may even be less than the risk assessment (Widarni & Bawono, 2022). The interest rate itself is influenced primarily by the central bank's monetary policy (Rusminingsih & Damayanti, 2022; Bernanke, 2020). As part of the money transmission interest rate channel, the Central Bank, by controlling funds industry interest prices, possesses the capacity to affect interest prices in major banking operations (Holton & d'Acri, 2018).

The current key interest rate and its expected future change show up in the yield on risk-free assets (mainly public sector bonds),as well as interest rate derivatives, particularly interest rate swap operations (Kumar, 2022). Swap of interest rates buyers is entitled to the difference between the prices right now. As a result, the buyer of an interest rate swap throughout the term of this contract can pool money market investments, pay a fixed amount, in spite of what fees have developed at the store (Bilan, Degryse, O'Flynn, & Ongena, 2019).

Operations in the money market, where the exchange rate can be determined through derivatives of interest rates, transactions involving securities, are a substitute for banks to carry out deposit and credit operations (Osayi, Kasimu, & Nkwonta, 2018). Assuming a fund could finance funds at the financial sector more cheaply compared to using home savings, it will generally use cheaper sources of funding for its operations or lower deposit rates (Eren, Schrimpf, & Sushko, 2020). Using same reasoning, when banks may where funds on a greater level in the money market price as opposed to the credit store, this would grow.their money market procedures and securities portfolios or raise loan interest rates (Duffie, 2022).

banks compete with one another to deposits & borrowers could impede this procedure (Vives, 2019). In order to keep up industry share, financial institutions simply lower deposit rates and raise lending rates, but over time term, Bankers will steer clear of unsuccessful company strategies (D'Erasmo, 2018). It must be as well taken into account it transactions in the money or stock market involve significantly lower transaction costs than withdrawing deposits or making loans (Ahmad, Green, & Jiang, 2020). Raising Money from those other bank is no necessary paying ante to a reserve fund, and placing short-term funds in money markets involves less credit risk than making loans (Hinrichs, 2021). Due to this interest fare on loans a constant noticeably better, & deposit rates are also noticeably less more money market value (Palley, 2019).

The ratio of funds industry interest rates and banking operational interest rates has been quite stable in recent years (Angori, Aristei, & Gallo, 2019). Hence, alterations to the prime pace or projections for its dynamics in the future, translate with a slight lull in bank lending and payment prices, indicating how well the economic policy works (Walter & Wansleben, 2020). In addition to changes in key interest rates, levels of loan for savings & lending are affected by current and anticipated GDP (Hong, Bian, Chen, & Su, 2020). In particular, current inflation and population expectations of inflation constrain deposit rates from below (Blanchard, 2019). As a result, deposit operations become less appealing to depositors if deposit rates decline below inflation, even more reductions in deposit rates become unjustified for banks (Kumhof & Noone, 2021). Consequently, the results of additional reductions in financial industry interest costs at banking operational interest cost weakened (Dell'Ariccia, Rabanal, & Sandri, 2018).

Inflation expectations related to bank predilections to the term architecture of loans and deposits also affect interest rates on loans and deposits (Yuan, Peng, Cai, & Zhang, 2022). more specifically , lengthy borrowing issued at comparatively low rates of interest today should be a topic of curiosity rate danger for financial institutions if upcoming inflation proves to be greater than the present (Ngalawa, Kirori, & Ngare, 2022). Financial institutions should get paid at the "old" interest rate, while deposit rates and, accordingly, bank interest rates increase their costs (Suu, Luu, Pho, & McAleer, 2020). Therefore, Short-term loans are more appealing to banks. Both at once, for investments, the threat of excessive inflationary works the other way around, the greater a future wage growth, the lower he quantity that banks will pay depositors in real terms so that banks are interested in attracting long-term investments deposit (Erülgen, Rjoub, & Adalıer, 2020). Consequently, specifically in the area of short-term banking operations, the variety of the range of interest tariffs fluctuated downward, which contributed the expansion of

simple loans thus lessening depositors' desire for simple loans (Wang, Zhao, & Li, 2022). On the long run operating segment, contrasted with, this range increased, as a consequence of that which depositors' attention at placing lengthy investments increased, Despite the allure of lengthy financing to borrowers, at the other hand, decreased (Andreeva & García-Posada, 2021).
The Bank's policy creates the conditions to a progressive decrease in lending scores & a thinning of the distance between the source & lending fees (Imbierowicz, Löffler, & Vogel, 2021). In further for the decelerate easing financial strategy, the reduction in lending and deposit rates was facilitated by lower inflation expectations as inflation slowed (Bordo & Levy, 2021). In addition, the Bank continues to encourage increased effectiveness of banking firms, especially with the advent of digitalization technology helps reduce operational costs and improve risk management which results in a reduction in the risk premium included in loan interest rates (Shair, Shaorong, Kamran, Hussain, Nawaz, & Nguyen, 2021). This creates the conditions for a further reduction at the distinction among lending rates & savings costs. This narrowing of spreads will also benefit from the bank's proportional regulatory transition (Bindseil, 2019). Without severe economic fluctuations, the policies adopted by the central company should continue reduce credit market interest rates (Colciago, Samarina, & de Haan, 2019). The purpose of here studying is for look into the result between variables on credit, non-performing loans, interest rates, exchange rates, and inflation.

Research Method

According to the study objective, specifically to ascertain the outcome between variables on credit, currency costs, bond yields, and inflationary, and deferred debts using secondary data from January 2000 to 2020 in Singapore. Data were Utilizing analysis to ascertain the relationship among the factors the Autoregressive Distributed Lag (ARDL). The model used in this study is as follows:

$$NPL_t = \beta_0 + \beta_1 CR_{t1} + \beta_2 INF_{t2} + \beta_3 EX_{t3} + \beta_4 IR_{t4} + ui_t$$

Where:
NPL = Non Performing Loan
CR = Credit growth of microfinance institutions
INF = Inflation rate
EX = Exchange rate
IR = Interest rate
ui = The term error
β0 = Parameter constant / Intercept
β1, β2, β3, = The coefficient of the independent variable is x1, x2, x3
t = time period

Results and Discussion

the root unit test's findings are needed to test stationarity. In ARDL estimation, stationary data is needed. Moreover, the outcomes of the unit root test show that all Info is constant. on the first different.

Table 1. Stationarity Test Results

	Level	First Different

	Probability	Caption	Probability	Caption
NPL	0.3412	not stationary	0.0000	stationary
CR	0.7116	not stationary	0.0000	stationary
INF	0.0000	stationary	0.0000	stationary
EX	0.3112	not stationary	0.0000	stationary
IR	0.0009	stationary	0.0000	stationary

Information: 5% probability

The score element is very important positive effect on NPL. This shows that the greater the credit issued, the more potential for non-performing loans to occur. However, the inflation has a variable no substantial impact at the NPL level. The exchange rate also has no significant effect on NPL. However, interest rates affect the score of NPL. The rate of exchange has a significant negative relationship, which means that the greater the exchange value, the less the NPL

Table 2. ARDL results

Variable	**Coefficient**	**T-statistics**
CR	0,02123*	0,61271
INF	0,07247	0,03723
EX	-0,00037*	-0,00824
IR	0,03212*	0,04152

Credit and interest rates are two key variables in the growth of banking services. Credit is part of the bank's revenue stream. However, every approved loan carries the risk of a non-performing loan. Likewise, interest rates are very influential on non-performing loans. The higher the interest rate, the riskier the increase in non-performing loans.

In spite of inflation has a substantial effect on the macro industry, it is surprising in this finding that inflation does not have major impact on quasi mortgages. Although, the exchange speed has a significant impact on defaulted loans in Singapore.

Conclusion

Each approved loan carries the risk of non-performing loans. The bond yields rising increases the risk of non-performing loans. However, inflation has no effect on non-performing loans in Singapore. However, the exchange rate actually has a significant negative relationship to non-performing loans where the stronger the Singapore currency reduces the risk of non-performing loans in Singapore.

References

Ahmad, A. H., Green, C., & Jiang, F. (2020). Mobile money, financial inclusion and development: A review with reference to African experience. Journal of Economic Surveys, 34(4), 753-792.

Andreeva, D. C., & García-Posada, M. (2021). The impact of the ECB's targeted long-term refinancing operations on banks' lending policies: The role of competition. Journal of Banking & Finance, 122(1), 1-10.

Angori, G., Aristei, D., & Gallo, M. (2019). Determinants of banks' net interest margin: Evidence from the Euro area during the crisis and post-crisis period. Sustainability, 11(14), 1-10.

Azmat, S., Azad, A. S., Bhatti, M. I., & Ghaffar, H. (2020). Islamic banking, costly religiosity, and competition. Journal of Financial Research, 43(2), 263-303.

Bernanke, B. S. (2020). The new tools of monetary policy. American Economic Review, 110(4), 943-83.

Bilan, A., Degryse, H., O'Flynn, K., & Ongena, S. (2019). Banking and financial markets: How banks and financial technology are reshaping financial markets. Cham : Springer Nature.

Bindseil, U. (2019). Central bank digital currency: Financial system implications and control. International Journal of Political Economy, 48(4), 303-335.

Blanchard, O. (2019). Public debt and low interest rates. American Economic Review, 109(4), 1197-1229.

Bordo, M. D., & Levy, M. D. (2021). Do enlarged fiscal deficits cause inflation? The historical record. Economic Affairs, 41(1), 59-83.

Brei, M., Borio, C., & Gambacorta, L. (2020). Bank intermediation activity in a low-interest-rate environment. Economic Notes, 49(2), 1-10.

Chioma, A. V., Okoye, N. E., Chidume, A. J., & Nnenna, O. G. (2021). Assessing the effect of capital adequacy risk and liquidity risk management on firm value of deposit money banks in Nigeria. African Journal of Accounting and Financial Research, 4(1), 33-49.

Colciago, A., Samarina, A., & de Haan, J. (2019). Central bank policies and income and wealth inequality: A survey. Journal of Economic Surveys, 33(4), 1199-1231.

Dell'Ariccia, G., Rabanal, P., & Sandri, D. (2018). Unconventional monetary policies in the euro area, Japan, and the United Kingdom. Journal of Economic Perspectives, 32(4), 147-72.

D'Erasmo, P. (2018). Are higher capital requirements worth it. Economic Insights, 3(2), 1-8.

Dörr, J. O., Licht, G., & Murmann, S. (2022). Small firms and the COVID-19 insolvency gap. Small Business Economics, 58(2), 887-917.

Duffie, D. (2022). Fragmenting Markets: Post-crisis Bank Regulations and Financial Market Liquidity. Berlin : Walter de Gruyter GmbH & Co KG.

Eidestedt, R., Forsman, D., & Ünlü, E. (2020). The funding of the major Swedish banks and its effect on household mortgage rates. Sveriges Riksbank Economic Commentaries, 8(1), 1-18.

Eren, E., Schrimpf, A., & Sushko, V. (2020). US dollar funding markets during the Covid-19 crisis—the international dimension. BIS Bulletin, 15(1), 1-7.

Erülgen, A., Rjoub, H., & Adalıer, A. (2020). Bank characteristics effect on capital structure: Evidence from PMG and CS-ARDL. Journal of Risk and Financial Management, 13(12), 1-10.

Fu, X., Li, M. C., & Molyneux, P. (2021). Credit default swap spreads: market conditions, firm performance, and the impact of the 2007–2009 financial crisis. Empirical Economics, 60(5), 2203-2225.

Hinrichs, K. (2021). Recent pension reforms in Europe: More challenges, new directions. An overview. Social Policy & Administration, 55(3), 409-422.

Holton, S., & d'Acri, C. R. (2018). Interest rate pass-through since the euro area crisis. Journal of Banking & Finance, 96(1), 277-291.

Hong, H., Bian, Z., Chen, N., & Su, C. (2020). Does interest rate liberalisation affect the constancy of mean interest rates in China?. Journal of Financial Regulation and Compliance, 28(4), 555-568.

Imbierowicz, B., Löffler, A., & Vogel, U. (2021). The transmission of bank capital requirements and monetary policy to bank lending in Germany. Review of International Economics, 29(1), 144-164.

Kelley, A., Steinberg, R., McCoy, T. P., Pack, R., & Pepion, L. (2021). Exploring recovery: Findings from a six-year evaluation of an American Indian peer recovery support program. Drug and alcohol dependence, 221(1), 1-10.

Kumhof, M., & Noone, C. (2021). Central bank digital currencies—Design principles for financial stability. Economic Analysis and Policy, 71(1), 553-572.

Kumar, S. (2022). Risk rationalization of OTC derivatives in SOFR (secured overnight funding rate) transition: evidence from linear interest rate derivatives. Academy of Accounting and Financial Studies Journal, 26(3), 1-22.

Ngalawa, J., Kirori, G. N., & Ngare, P. (2022). The Role of Maturity Gaps and Short-Term Market Interest Rates on Interest Rate Risk Exposure in Commercial Banks in Kenya. Journal of Finance and Accounting, 6(2), 102-120.

Nguyen, H. D. H., & Dang, V. D. (2020). Bank-specific determinants of loan growth in Vietnam: Evidence from the CAMELS approach. The Journal of Asian Finance, Economics and Business, 7(9), 179-189.

Osayi, V. I., Kasimu, A., & Nkwonta, H. C. (2018). Financial market derivatives and the performance of deposit money banks in Nigeria. International Journal of Economics, Commerce and Management, 6(11), 382-396.

Pahnecke, O., & Bohoslavsky, J. P. (2021). Interest rates and human rights: reinterpreting risk premiums to adjust the financial economy. Yale Journal of International Law, 46(1), 1-46.

Palley, T. I. (2019). The fallacy of the natural rate of interest and zero lower bound economics: why negative interest rates may not remedy Keynesian unemployment. Review of Keynesian Economics, 7(2), 151-170.

Prabowo,B.H.(2017).Analisis Faktor Cash Position, Debt To Equity Ratio Dan Return On Assets Terhadap Dividend Payout Ratio Pada Perusahaan Consumer Good Di BEI.Jurnal Akuntansi Jayanegara,9(1),1-10.

Prabowo,B.H., Sasongko,B., & Damayanti,L.(2022). Economic Challenges And The Potential Threat Of A Debt Trap In Asia,5(1),53-63

Rusminingsih,D., & Damayanti,L.(2022).The Role Of Financial Literacy On Economic Growth And Human Capital In Thailand.Tamansiswa Accounting Journal International,4(1),52-57

Shahzad, S. J. H., Bouri, E., Kristoufek, L., & Saeed, T. (2021). Impact of the COVID-19 outbreak on the US equity sectors: Evidence from quantile return spillovers. Financial Innovation, 7(1), 1-23.

Shair, F., Shaorong, S., Kamran, H. W., Hussain, M. S., Nawaz, M. A., & Nguyen, V. C. (2021). Assessing the efficiency and total factor productivity growth of the banking industry: do environmental concerns matters?. Environmental Science and Pollution Research, 28(16), 20822-20838.

Song, H., Yang, Y., & Tao, Z. (2020). How different types of financial service providers support small-and medium-enterprises under the impact of COVID-19 pandemic: from the perspective of expectancy theory. Frontiers of Business Research in China, 14(1), 1-27.

Spears, T. (2019). Discounting collateral: quants, derivatives and the reconstruction of the 'risk-free rate'after the financial crisis. Economy and Society, 48(3), 342-370.

Suu, N. D., Luu, T. Q., Pho, K. H., & McAleer, M. (2020). Net interest margin of commercial banks in Vietnam. Advances in Decision Sciences, 24(1), 1-27.

Viphindrartin, S., Wilantari, R. N., & Bawono, S. (2022). The comparison of the islamic and conventional bank performance before and during Covid-19 pandemic in Indonesia. Journal of Management and Business, 21(1), 76-84.

Vives, X. (2019). Competition and stability in modern banking: A post-crisis perspective. International Journal of Industrial Organization, 64(1), 55-69.

Wang, Z., Zhao, H., & Li, L. (2022). The positive side of bank wealth management products: Evidence from bank lending rate. Journal of Financial Stability, 58(1), 1-10.

Whited, T. M., Wu, Y., & Xiao, K. (2021). Low interest rates and risk incentives for banks with market power. Journal of Monetary Economics, 121(1), 155-174.

Widarni, E. L., & Bawono, S. (2022). The Role of Human Capital on the Performance of Islamic Banks in Indonesia, Malaysia, and Thailand. In Brawijaya International Conference on Economics, Business and Finance 2021 (BICEBF 2021) (pp. 172-180). Atlantis Press.

Wilantari, R. N., Widarni, E. L., & Bawono, S. (2021). Investment, Deposit Interest Rates, and Real Sector Performance: A Case Study of Islamic Finance in Malaysia. Muqtasid: Jurnal Ekonomi dan Perbankan Syariah, 12(2), 144-154.

Yuan, J., Peng, Y., Cai, Z., & Zhang, Z. (2022). A Quantitative Evaluation of Interest Rate Liberalization Reform in China. ANNALS OF ECONOMICS AND FINANCE, 23(2), 197-221.

Zahariev, A., Angelov, P., & Zarkova, S. (2022). Estimation of Bank Profitability Using Vector Error Correction Model and Support Vector Regression. Economic Alternatives, 2(1), 157-170.