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Transmission of the Global Bank Liquidity Shock: Evidence from the US Foreign Bank Loans to Southeast Asian Economies

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Abstract: The empirical debate of foreign bank loans as an international intermediation transfer from industrialized to developing market economies, which concentrated on expenses and advantages, has continued. Our manuscript analyzes the determinants of US bank loans in selected Southeast Asian emerging markets. The most critical variables, based on the statistical approach built around the system-GMM, have a considerable effect on the growth rates of the origin and destination countries. Remarkably, the exchange rate significantly becomes a risk indicator which decrease the US bank flow. Finally, shock in the US economy has been transmitted to the Southeast Asian economies through foreign bank flow.

Keywords: Foreign Bank Flow; Financial Crisis Contagion; Southeast Asia; Exchange Rate; System-GMM

JEL Classification: E44; G24

Introduction

Beginning in the 1990s, which came to be known as the monetary period of globalization, banks from rich nations began investing in developing market economies (Choi & Furceri, 2019; Schmidt et al., 2018). International financial institutions from industrialized nations lend to cross-border economies for various reasons (Albrizio et al., 2020; Forbes et al., 2017; Gurara et al., 2020; Van Nguyen et al., 2022; Xu & La, 2017). One of the reasons is that rich countries have increased competition and lending to emerging economies.

In any other case, simultaneous financial sector deregulation in emerging nations supports bank reform in wealthy nations. Financial institutions in emerging market nations began switching from local to external support as a capital source (Abbassi et al., 2022; Haddou, 2022; Takáts & Temesvary, 2020). By lowering their monetary entrance barriers, emerging market nations gave up their command over international bank capital flow. As a result, banks in industrialized nations may now invest more freely to grow the domestic financial system. D'Avino (2018) and Morales et al. (2022) explained that an alliance of global bank loans had advanced the financial link between established and emerging economies. Home nations can grow their economies, while host nations can get money from wealthy nations.

According to the bank lending flow factors, Forbes et al. (2017), Shareef and Prabheesh (2020), and Takáts and Temesvary (2020) noted that The loan supply was impacted by market turmoil. However, a slowdown in the business cycle in one's own country had less precise results. A lender will be encouraged to reduce loans to emerging markets when the home nations have experienced a significant financial crisis to assist those countries' economy recuperating. From a different angle, a weaker domestic economy will encourage bank lending outside its borders to reduce the bankruptcy risk associated with its asset allocation goals.

Using banks' balance sheets as a basis, banks have three different responses when foreign obligations suddenly increase (Forbes et al., 2017; Ginting & Widyawati, 2022; Morais et al., 2019). The bank will first add to its domestic obligations. By cutting back on its loans to non-residents, the financial institution will decrease its overseas portfolio. Finally, the bank will lower local claims by cutting back on lending to locals. Due to the shock of the worldwide financial collapse of 2007-2008, the lending of US foreign banks has significantly shrunk. It causes the second response. Auer et al. (2019), Avdjiev et al. (2020), and Van Nguyen et al. (2022) have argued that Difficulty in the US financial industry pushed international banks to expand through the financing market, and shock in the banking institutions was conveyed internationally by lowering bank lending.

As one of the biggest economies in the world, the US began subsidizing the developing market economies through early financial development (Avdjiev & Hale, 2019; Barrell & Nahhas, 2020; Cerutti & Osorio-Buitron, 2020). Lee and Bowdler (2022) explained that the US banks have been flowing more liquidity to emerging countries during the 1980s and 1990s since the vent of bank regulation in some of the Southeast Asian Economies in order to finance their rapid economic growth. The economies of Southeast Asia have been receiving cross-border financing from US banks since the end of 1983. The US is now one of the leading issuers to the economies of Southeast Asia because of the financing from US banks, which has expanded global credit. According to BIS, the total amount of claims from the US throughout 2018 is USD 243,692 million. As a result, it is accompanied by a total of USD 243,383 million claims from the United Kingdom. The overall liabilities from US banks are growing annually, despite the fact that Japan has the most considerable banking participation among Southeast Asia.

Interconnection between the US and Southeast Asian countries in this financial aspect has included the countries facing the risk of a typical lender channel. A sudden loss in a lender country may force their banks to withdraw their portfolio from borrower countries due to the rebalancing risk and satisfying regulatory constraints (Albrizio et al., 2020; Choi et al., 2021; Park & Shin, 2021). Atyabi et al. (2020) and Murai and Schnabl (2021) explained that this kind of capital outflow might transmit turmoil over the globe, especially the borrowers. Therefore, research tends to place a particular emphasis on the transmission of the global financial crisis becomes fascinating to be explored.

The prior studies, which have used a variety of tools, look at how the global financial meltdown spread from industrialized to developing countries through the foreign bank lending channel. They offered many genres of writing that segmented the characteristics

within the native country's (push) and host country's (pull) factors (Abbassi et al., 2022; Albrizio et al., 2020; Avdjiev et al., 2020; Barrell & Nahhas, 2020; Choi et al., 2021; Choi & Furceri, 2019; Haddou, 2022; Shareef & Prabheesh, 2020). The study by Abbassi et al. (2022), Choi and Furceri (2019), Haddou (2022), and Shareef and Prabheesh (2020) provide a lender-side analysis, revealing that decrease in the home countries' economy reduces overseas bank loans. With the same perspective of lender's point of view, Albrizio et al. (2020), Avdjiev et al. (2020), and Choi et al. (2021) show a similar decrease in home lending due to a more tightening monetary policy in host countries as a borrower. Based on the opposite perspective, Barrell and Nahhas (2020) and Haddou (2022) provide a shred of evidence that borrower countries' conditions, such as business cycle and rate of return, improve cross-border lending attraction. However, most previous studies provide the volatility impact of currency rates as one of the avenues that attract international bank loans in developing economies.

This study attempts to bridge the gap by providing an analysis of the effect of currency crises on cross-border bank lending as a global financial shock transmitter from the US to Southeast Asian emerging economies. Our study makes three more contributions. First, we provide a broader literature of what drives the international bank flow with different variabilities effects based on various methods applied. Second, due to the paucity of research, this manuscript enables us to compare the various exchange rates and US dollar vis-à-vis currencies of the specific region of Southeast Asian economies. Third, we show contagion evidence of global liquidity shock from the Us to the Southeast Asian economies through cross-border bank lending channels.

The following is how this study's next section is structured. The second section provides a sneak peek at the earlier related research on the factors that influence international bank lending. In order to deliver the most relevant study, the third section describes the research methodology, comprising material, assessments, econometric modeling, and approach. The fourth portion of the essay will explain the research outcome. Additionally, part five will include a summary of the conclusion, which is last but not least.

Research Method

Data

Quarterly data were utilized for the study from the first quarter of 1986 to the first quarter of 2019. The entire data was mainly gathered from the Bank for International Settlements (BIS), the Federal Reserve Bank of St. Louis (the Fed), and the International Monetary Fund (IMF). Southeast Asian international bank loans by US banks are the dependent variable. Consolidated Banking Statistics from the Bank for International Settlement's official website provided the information we used. Specifically, we employed cross-border bank claims. A bidirectional dataset comprises international claims, classified as the aggregate amount of loans lent by international banks with abroad headquarters and loans offered by subsidiaries in host countries. Therefore, in the analysis, Indonesia, Malaysia, the

Philippines, Singapore, and Thailand were the primary recipients of foreign bank loans from the US as well as the sample of research.

The mobility of cross-border bank loans is estimated using seven independent variables. The dependent variables are automatically used to generate the lag of international bank loans. The real gross domestic product (GDP) data are gathered from the World Bank's official website and are expressed in current US dollars for Southeast Asia and the US as the host and home nations, respectively. The data depict the business cycle in the US and Southeast Asian economies.

The US 3-month T-Bill value is provided by the Fed. The rate of return in the Southeast Asian nations and the exchange rate between the Southeast Asian exchange rates and the US dollar are provided by IMF. In addition, to examine how the world catastrophe is transmitted through foreign bank loans from the US to developing Southeast Asian nations, we separated two variables: US GDP growth and credit exposure to Southeast Asian economies.

Empirical Model

We updated the equation to include exchange rate fluctuations because the principal goal of our study is to examine the fundamental factors influencing cross-border bank lending. Equation (1) describes how the study's initial model is converted into an econometrics approach.

$$FBL_t = \alpha_0 + \alpha_1 FBL_{t-1} + \beta_1 BChome_t + \beta_2 BChost_t + \beta_3 IRhome_t + \beta_4 IRhost_t + \beta_5 CUR_t + \beta_6 BChome_t.EX_t + \varepsilon_t$$

FBL_t denotes the foreign bank loans from the US to Southeast Asian countries. We also present an autoregressive of the dependent variable, FBL_{t-1} , as the loans in the post period; $BChome_t$ is the US' business cycle; $BChost_t$ represents Southeast Asia's business cycle; $IRhome_t$ is the US rate of return while $IRhost_t$ is the rate of return in each of Southeast Asia; CUR_t shows the Southeast Asian's currency in pairing to the US dollar; $BChome_t.EX_t$ is the response indicator of the US banks towards the global crisis, and ε_t denotes the error term.

Estimation Strategy

This study estimates the factors influencing US international bank loans as shown in equation (1). We used the three dynamic equation estimators known as Fixed Effect (FE), Ordinary Least Square (OLS) for panel data, and Generalized Method of Moments (GMM-SYS). We instrumented each possible coefficient of determination with a suitable lag to lessen the endogeneity influence on the model. The results of using other dynamic models (pooled OLS and fixed effect) typically lead to an estimated bias; the fixed effect model's bias was downward, and the OLS autoregressive coefficient had an upward bias (D'Avino, 2018; Haddou, 2022; Takáts & Temesvary, 2020). Typically, Arrelano-Bond estimation utilizes a large dataset to offer a bias-free result with the assumption that the cost of the

coefficient would fall between OLS and fixed effect estimations. We employed the system GMM by Blundell & Bond (1998). When working with tiny samples, the system-GMM can achieve significant gains through the difference-GMM. There are sections in System-GMM that are inserted on lagged initial variations and the first difference.

Result and Discussion

The Effect of Growth Rate on Foreign Bank Loan

To address the vagueness of the coefficient of the US business cycle, the findings indicate that the coefficient of the US business cycle ($BChome_t$) has a substantial influence on the dynamic of international bank loans for each estimator. When the US business cycle began to weaken, banks in the US tended to concentrate their loans domestically, according to the high correlation of the US business cycle. This finding supports the research of Abbassi et al. (2022), Benincasa, (2021), Choi and Furceri (2019), Park and Shin (2021), and Shareef & Prabheesh (2020) that International bank lending to host nations decreases in response to a downturn in the domestic business cycle.

Table 1 Dynamic Estimation Analysis

	OLS	FE	GMM-SYS
C	-7.904*** (4.212)	-3.980*** (1.556)	-5.647*** (1.748)
FBL_{t-1}	0.355*** (0.630)	0.730*** (0.423)	0.521*** (0.786)
$BChome_t$	0.125*** (0.436)	0.753*** (0.756)	0.476*** (0.456)
$BChost_t$	0.756*** (0.476)	0.129*** (0.726)	0.235*** (0.435)
$IRhome_t$	-0.276* (0.002)	-0.148 (0.007)	-0.265** (0.005)
$IRhost_t$	0.189 (0.006)	0.162* (0.007)	0.009 (0.011)
CUR_t	-0.027** (0.004)	-0.036 (0.049)	-0.076*** (0.008)
$BChome_t \cdot EX_t$	0.348*** (0.066)	0.231*** (0.087)	0.278*** (0.033)
R^2	0.865	0.729	0.832
Total Instruments			8
J-test			3.02E-8

The standard error is shown by numbers in parentheses (). At 1, 5, and 10% of the statistical significance, correspondingly, an arrow (***, **, and *) denotes the null hypothesis is rejected.

The GMM estimation for the Southeast Asian business cycle yields a substantial value of 1% with a favorable sign, along with the level of domestic economic growth. The coefficient of $BChost_t$ is 0.235 implies that a rise in the economic growth rate of as much

as 1 million US dollars, the lending from the US banks increased by as much as 23.5%. It proves that the business activities of Southeast Asians attracted cross-border loans from US institutions. Banks across industrialized countries have been intrigued to grow their loans because economic growth in the majority of Southeast Asia has been developing in current history. However, with a decrease in the economy of the home countries, cross-border banks will attract their loans. Following some previous studies by Barrell and Nahhas (2020), Choi and Furceri (2019), and Shareef and Prabheesh (2020) came to a conclusion from their shared empirical results that when host economies experienced an economic downturn, international banks responded by cutting back on their loans to those nations.

The Effect of Rate of Return on Cross-Border Bank Lending

The outcome offers a considerable influence on the predicted indicators for the nominal rate of return of the home nation (IR_{home_t}). This finding suggests that one of the relevant push variables is the nominal interest rate. Higher home country interest rates enable higher rates of return and draw foreign banks to provide domestic lending channels.

Furthermore, our result is generally in line with the study of Haddou (2022) and Shareef and Prabheesh (2020) have obtained an exact conclusion, namely that domestic country interest rates significantly affect credit expansion in emerging economies. The global banks seek land with a higher rate of return, significantly when their home country increases the interest rate, and their lending to the cross-border land will be lower. An empirical finding of Haddou (2022) explains that a rise in home-country lending rates discouraged foreign loans to the host countries.

Inversely, Shareef and Prabheesh (2020) reached a similar conclusion that foreign banking flows to emerging market economies were unaffected by the interest rates in developing nations (IR_{host_t}). In another previous empirical result, Takáts and Temesvary (2020) have outlined how risk indicators and interest rates have been linked to financial intermediation admiration. Since the movement of the foreign bank flow is not alongside the interest rate even, they do not have a reverse relationship, the Southeast Asian interest rate cannot be a pull factor of the global bank credits from the US.

Transmission of the Global Liquidity Shock on Foreign Bank Loans

Another critical determinant of the foreign bank flow is the exchange rate volatility (CUR_t). This variable influences the ebb and flow of cross-border bank lending through a financial channel (Avdjiev & Takáts, 2019; Benincasa, 2021; Buch et al., 2019; Filardo & Siklos, 2020; Niepmann & Schmidt-Eisenlohr, 2022; Takáts & Temesvary, 2020, 2021). Park and Shin (2021) and Xu and La (2017) explain that the exchange rate is one transmission shock channel from the perspective of host countries. The difference in currency rates between the domestic and host nations supports the conclusion of Niepmann and Schmidt-Eisenlohr (2022), who revealed a major inverse impact on international bank financing in developing nations. Nevertheless, it deviates from the results of Park and Shin (2021) and Benincasa (2021), who found a substantial favorable return for overall considered

equations. The bilateral exchange rate indicates both financial independence and currency risk. Given that We utilized the exchange band's spot rates, the more the exchange rate increased, the more the host nation's currency depreciated. Reducing global banks' loans to developing market economies becomes a risk issue.

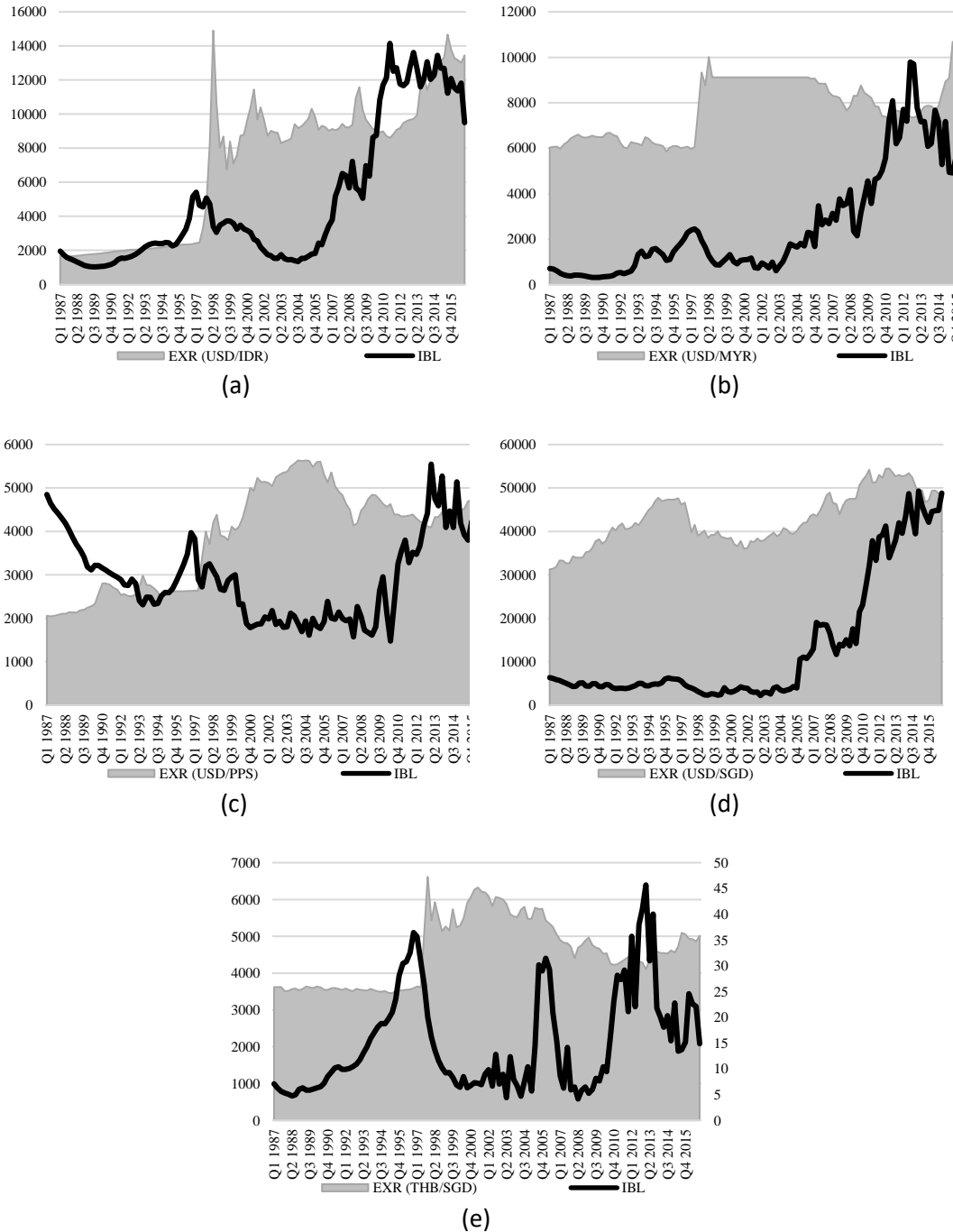


Figure 1 bank loans and the exchange rate of (a) Indonesia; (b) Malaysia; (c) Philippines; (d) Singapore; and (e) Thailand vis-à-vis US dollar (Source: IMF and BIS, 2022).

The coefficient of the exchange rate variable is -0.076, which implies that a rise in the currency depreciation of as much as one basis point negatively affects the lending from the US banks to the Southeast Asian economies, causing to decrease in about as much as 7.6 percent. This result provides a cross-empirical debate to the finding of Niepmann and Schmidt-Eisenlohr (2022), who explained that increased currency depreciation might improve foreign bank lending to the host countries since the borrowers in emerging economies tend to have the domestic currency-denominated asset and foreign currency-denominated liabilities. However, our result indicates that a higher level of currency depreciation enhances a higher risk inside the exchange rate. This becomes a visible phenomenon by the global banks to attract their lending from the host countries.

Figure 1 explains that the US foreign bank loans and currency pairs of the US dollar vis-à-vis Southeast Asian currencies have a cross-movement path along the observation period. The high caprioles of the exchange rate for the period of 1997s were caused by the Asian financial crisis that declined the value of currencies in Southeast Asia towards the US dollar. The highest depreciation period causes a 50 percent decline in US bank flow. The most profound decline happened in Thailand in the last quarter of 1996, around 5103.5 US dollars, then jumped down around 2253 US dollars at the beginning of 1998 when the exchange rate of USD/THB fell from the third quarter of 1996 to 25.42 basis points to 47.25 basis points at the last quarter of 1997.

From the home country's perspective, loans through foreign banks are how the worldwide crisis is spread (Lee & Bowdler, 2022; Morais et al., 2019). Testing the effects of crisis from the lender country on the ebb and flow to the recipient economies, we measured our primary variable using a factor affecting how the US growth rate and vulnerability intersect with the individual ASEAN-5 economies. At 1%, the measure of the domestic banking system's reaction to the international catastrophe ($BChome_t.EX_t$) has a significant affirmative impact. It pictures the continuity of the lending to ASEAN-5 as their reaction to the decline in the US economy. The outcome suggests that, in response to the US economic downturn or shock, US banks raised their exposure to the banking system and decreased their overseas lending. It illustrates the shock-transmission impact of American loans by foreign banks to Southeast Asian economies. Similarly, this outcome bears relevance to the research of Albrizio et al. (2020), Avdjiev et al. (2020), and Choi et al. (2021), who explained that When major financial institutions discovered financial turmoil, investors began to invest in undeveloped countries.

Conclusion

International bank flow from rich to developing market countries has significantly improved due to financial deregulation. Our research yields the following findings: first, the expansion of emerging economies' economic cycles has compelled industrialized nations to stop receiving foreign bank loans. Second, the major attraction of the exchange rate provides an inverse effect on the flow of multilateral bank loans and the propagation vibration signal, which is the consequence of the interaction between the growth rate of the country of origin and its exposure in the various host countries, has been shown to

force the worldwide distress into the host countries. Third, instead of focusing on borrowing costs in emerging countries, banks in industrialized nations took risk considerations into account. It was demonstrated by the host country's negligible cost of borrowing and backed up by the currency couple's favorably substantial currency value. In order to strengthen the banking industry while preserving the opportunity for local banks to contribute to worldwide financial leverage, we propose that emerging economies promote the subsidiaries of foreign banks, start engaging in cooperative global commercial bank monitoring, and providing a more robust regulation for the global bank intermediation by the authority of Southeast Asian Countries. Our study is limited to macro level analysis employing cross-border data. Therefore, for further analysis, research based on specific bank level data would provide a deeper identification of shock transmission estimation.

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