THE IMPACT OF THE CAPITALIZATION SIZE OF 4 TYPICAL STABLECOINS ON THE VALUE OF EXCHANGE RATES - CASE STUDIES IN 3 TYPICAL SOUTHEAST ASIAN COUNTRIES

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Abstract: *Currently, stablecoin transactions are playing an important, increasingly large role in currency transactions around the world. The study uses error correction vector modeling (VECM) to examine the impact of capitalization on stablecoins on the value of some national currencies in Southeast Asian countries (including Vietnam), between 2020 and 2023. The study provides empirical evidence on the impact of transaction sizes on USDT (Tether), USDC (Circle), DAI (Ethereum DeFi Ecosystem), BUSD (Binance) on the value of national currencies measured in hard currencies including USD/SGD, USD/THB, USD/VND, data is taken by day, thereby showing that SGD, THB currencies are strongly affected, VND is weaker but lasting.*

1. Introduction

Current payment systems are undergoing increasing disruption due to the global trend of digitizing payments and creating new business models using blockchain-based programmable digital currency. Several new payment initiatives have recently been announced, and stablecoins are also gaining importance. Central banks are also discussing the introduction of their own digital currencies, known as CBDCs (Central Bank Digital Currency). However, to date, these payment innovations have not been fully discussed and analyzed from the perspectives of different industries and sectors, as their implications remain unclear due to most initiatives not yet being launched (Sandner et al., 2020).

Stablecoins are second-generation cryptocurrencies designed to maintain their value stable relative to official currencies. The most famous example is probably Libra, the cryptocurrency announced by Facebook in 2019 and yet to be released. The most popular stablecoin is Tether, with a market cap of nearly $10 billion and a daily trading volume of nearly $50 billion, making it the most used cryptocurrency. The popularity of stablecoins is hardly surprising. By minimizing volatility - the main flaw of first-generation cryptocurrencies,

including bitcoin - stablecoins are expected to play an even more important role globally in the next few years (Fantacci et al., 2021).

The value of traditional currencies is also affected by stablecoins or digital currencies. The dynamic competition between national fiat currencies, cryptocurrencies, and Central Bank digital currencies (CBDCs) models a scenario where a country's financial power and currency strength mutually reinforce each other (Cong et al., 2022). Since cryptocurrencies are not issued by a centralized authority and do not rely on official legal tender status for acceptance, the principles of stablecoins and whether the rise of cryptocurrencies may or may not constitute monetary competition are still being debated (Fantacci, L., 2019).

Vietnam cannot be excluded from the spillover influence of digital currencies or stablecoins. If China-modeled CBDCs, such as DCEP (digital yuan), can overcome technological challenges and be recognized as effective in addressing issues such as safety, convenient payments, and the promotion of financial inclusion, it could spread to other emerging countries through a shortcut effect. Emerging economies face such challenges, and currency pricing is reducing the shock-absorbing properties of flexible exchange rates and changing

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the inflation-output volatility trade-offs faced by monetary policymakers (Carney, M., 2019).

However, existing studies have largely overlooked the capitalization of stablecoins or the value of some national currencies, focusing primarily on China. Therefore, research gaps remain relatively large for domestic scientific works. This study aims to examine the impact of stablecoin capitalization on the value of some national currencies in Southeast Asian countries.

2. Literature review

The related studies were synthesized into three research groups. The first direction of research concerns central bank cryptocurrencies and their implications. According to Claeys et al. (2019), the advent of CBDCs can also be disruptive and create risks, particularly regarding financial intermediation. This research paper sheds light on perceptions of payment initiatives by interviewing more than 50 senior experts. In this study, the team analyzes the impact of digitally programmable Euro initiatives, such as the Libra stablecoin and CBDC, on banks. The team found that both Libra and Euro CBDC could significantly impact European banks, potentially leading to large-scale dispersion of the financial sector and triggering digital bank withdrawals. Despite these risks, the team's findings suggest that banks also have opportunities to develop new business models stemming from these initiatives. Therefore, Libra and Euro CBDCs are not only seen as threats but also as opportunities (Sandner et al., 2020).

The second line of research concerns the role of stablecoins and their impact on various financial and geopolitical factors. According to Li et al. (2022), stablecoins are at the center of the debate around decentralized assets. The model streamlines many stablecoin management strategies commonly found in practice, and the study describes an instability trap: Stability can persist for a long time, but once devaluation occurs, price volatility continues. In particular, along with other alternative electronic payment systems, stablecoins can be used as a means to evade economic sanctions and ultimately challenge the hegemony of the US dollar in the international monetary system (Fantacci et al., 2021). In the digital currency economy, where stablecoins are an important means of payment, the domestic and international macroeconomic impact of a monetary policy shock may be smaller

or greater than in a predominantly cash-based economy, depending on how the assets supporting the stablecoin supply react to the shock. However, the standard transmission of the monetary policy shock could essentially be restored in the digital currency economy: 1) if the stablecoin is backed entirely by cash or 2) if the CBDC is a relevant means of payment (Cova et al., 2022).

The third direction of research focuses on digital currencies and stablecoins related to the competitiveness of the economy. According to Cong & Colleagues (2022), the research team models the dynamic competition between national fiat currencies, cryptocurrencies, and Central Bank digital currencies, whereby a country's financial strength and monetary strength are mutually reinforcing. The rise of cryptocurrencies hurts stronger fiat currencies but could benefit weaker fiat currencies by reducing competition from stronger ones. CBDCs should be seen in the context of the increasing digitization of the economy and the centrality of data - especially personal data - both economically and in the monetary system. However, data also brings new challenges to competition, privacy, and integrity. Since certain effects of the network effect on currencies have raised concerns that new buyers are individual investors, businesses outside of traditional members can control the monetary system, leading to serious competition and against the interests of society (Phong et al., 2022).

Thus, the studies have not mentioned the capitalization of stablecoins in relation to the value of some national currencies, especially since the above studies are not necessarily focused on Southeast Asian countries but rather on China. Therefore, research gaps are still relatively large for domestic scientific works.

3. Data and methodology

The study has 7 variables: USDT, USDC, DAI, BUSD, USD/SGD, USD/THB, USD/VND. Data is taken by date in 2020-2023.

The VECM model has a general form:

$$Yt - Yt\text{-}1 = (A1 + A2 + ... + Ap\text{-} I)Y_{t\text{-}1} - (A2 + ... + Ap)(Yt\text{-}1 - Y_{t\text{-}2}) - (A3 + ... + App))(Yt\text{-}2 - Y_{t\text{-}3})$$

$$-... - A_p(AND_{t\text{-}p+1} - And_{t\text{-}p}) + ut$$

$$Y_t = Y_{t\text{-}1} + C1Y_{t\text{-}1} + C2Y_{t\text{-}2} + ... + Cp\text{-}1Y_{t\text{-}p+1} + C$$

The model contains the term $Y_{t\text{-}1}$. This is the error correction part.

The VECM model is used because it does not distinguish between endogenous or exogenous variables, which is suitable for considering the causal effects of variables when included in the model. In addition, the VECM model integrates the functions of variance decay and pulse response to support the consideration and examination of the impact of capitalization levels on stablecoins on the value of some local currencies in Southeast Asian countries. The ECM equilibrium coefficient makes it possible to measure the degree of impact of variables in the short and long term.

4. Results

4.1. Model tests

4.1.1. Stoppage of data series

Apply the Dickey - Fuller unit test method to verify the stoppage for transaction size data series for USDT (Tether); transaction size for USDC (Circle); transaction size for DAI (Ethereum DeFi Ecosystem); trade size for BUSD (Binance); USD/SGD exchange rate; USD/THB exchange rate; exchange rate USD/VND.

Table 1. Stoppage testing of data series (d=1)

Chain stoppage verification	t-Statistic	Prob.*
USDT stops at the wrong tier 1	-3,351961	0,0140
USDC stops at the wrong tier 1	-4,266532	0,0007
DAI stops at the wrong tier 1	-10,69733	0,0000
BUSD stops at the wrong tier 1	-16,16720	0,0000
USD/SGD stops at the wrong tier 1	-13,85359	0,0000
USD/THB stops at the wrong tier 1	-11,28482	0,0000
USD/VND stops at the wrong tier 1	-11,25654	0,0000

Source: Compiled from regression results.

Test results with a significance of $\alpha = 0.05\%$ of USDT, USDC, DAI, BUSD, USD/SGD, USD/THB, USD/VND chains stopped at the same level of Tier 1 error. Thus, the data series stopped at the same level of differential differential.

4.1.2. Co-link inspection

The chains USDT, USDC, DAI, BUSD, USD/SGD, USD/THB, USD/VND all stop at the wrong tier 1: I(1). Use the Johansen test to check if USDT, USDC, DAI, BUSD, USD/SGD, USD/THB, USD/VND are co-linked.

Table 2. Co-link audit

External links	Own value.	Statistical value.	0.05 significance level	P-value
Not	0,796662	412,2014	125,6154	0,0000
At least 1	0,207063	111,1456	95,75366	0,0029
At least 2	0,116121	67,29539	69,81889	0,0782
At least 3	0,093789	43,96613	47,85613	0,1107
At least 4	0,069262	25,35285	29,79707	0,1492
At least 5	0,058524	11,78686	15,49471	0,1674
At least 6	0,002056	0,389011	3,841466	0,5328

Source: Compiled from regression results.

The test results show that the value P = 0.0000 < α, which should reject the Ho: r=0 hypothesis (there is no co-link between variables), there is co-bonding between strings at a significance level of α = 0.05.

The same results obtained for the maximum number of linked coins test show that USDT, USDC, DAI, BUSD, USD/SGD, USD/THB, USD/VND have co-links, at a significant level α = 0.05, when k = 1, p = 0.0180< α the Ho: r=1 hypothesis should be rejected (there is at least 1 copper associated between variables). Chains have 2 ways of combining co-links.

4.1.3. Verify optimal latency selection for the model

Use LogL, LR, FPE, AIC, SC, HQ criteria to determine the optimal latency for the model. In this case, LR, FPE, AIC, HQ criteria will be used to determine the optimal latency for the model. The optimal latency of the VECM model will be selected from the optimal latency of the VAR model after a one-step downfall. Thus, the optimal latency of the VECM model is latency 3.

**Table 3. Optimal latency selection of VECM model**

Selection of the optimal latency of the VAR model					
Latency	LogL	LR	FPE	AIC	SC	HQ
1	1857,777	ON	1:15e-17	-19,14049	-18,30004*	-18,80001
2	1971,641	210,8601	5:79e-18	-19,82689	-18,14599	-19,14592
3	2066,522	168,6763	3.58e-18	-20,31240	-17,79104	-19,29094
4	2181,658	196,1584*	1.79e-18*	-21,01226*	17,65044	-19,65030*

* indicates the latency selected according to the criteria.

Source: Compiled from regression results.

4.1.4. Model stability verification

**Figure 1. Model stability verification**
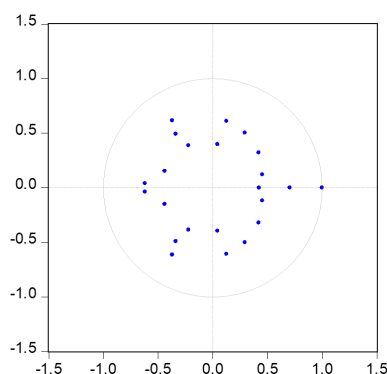
Source: Compiled from regression results.

To verify the stability of the VECM model, using AR Root Test to look at solutions or specific values that are not outside the unit circle, the VECM model will achieve stability.

4.1.5. Checking the white noise of the residual

Figure 2. Checking the white noise of the residual

VEC Structural Residuals using Cholesky (d.f. adjusted) Factors
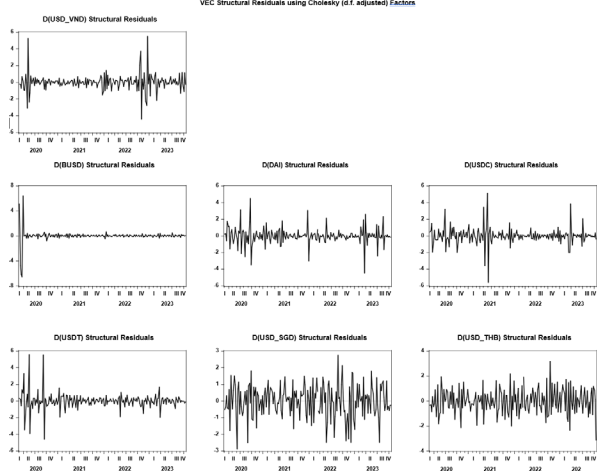
Source: Compiled from regression results

The residual part of the VECM model must be white noise for the VECM model to be used for forecasting.

The results show that the excess is within the permissible limits, so there is no self-correlation. The VECM model is suitable for regression.

4.2. Results of the model and discussion

Table 4. VECM regression model

Cointegrating Eq:	CointEq1
D(BUSD(-1))	1,000000
D(DAI(-1))	18,72320
	(7,85789)
	[2,38273]
D(USDC(-1))	-15,42868
	(9,97017)
	[-1,54748]
D(USDT(-1))	37,81206
	(13,4733)
	[2,80645]
D(USD_SGD(-1))	1377,796
	(87,8305)
	[15,6870]
D(USD_THB(-1))	-13,93826
	(2,26526)
	[-6,15306]
D(USD_VND(-1))	-378,3429
	(132,004)
	[-2,86615]
C	-0,024513

Error Correction:	BUSD	Come on	USDC	USDT	USD/SGD	USD/THB	USDVND
CointEq1	-0,001937	-0,001476	-0,000374	-0,001826	-0,000802	-0,006262	8.82E-05
	(0,00687)	(0,00069)	(0,00050)	(0,00040)	(6:9E-05)	(0,00315)	(4:1E-05)
	[-0,28185]	[-2,1407]	[-0,75099]	[-4,53959]	[-11,6743]	[-1,98906]	[2,15127]

Source: Compiled from regression results.

The results of the VECM model, variance decay functions and integrated pulse response support the study to verify the interaction between data series. The equilibrium coefficient allows to consider relationships both in the short and long term, the impact graph shows no signs of fading but moves from one equilibrium to another thus allowing a full assessment of the dynamic interconnectedness of variables.

The results of the pulse reaction show that the direction of the USD/SGD reaction to shocks changes the capitalization of stablecoins is quite large from period 2 and shows no signs of fading after that. The USD/SGD exchange rate is strongly influenced by the capitalization of the stablecoins BUSD and USDC. The USD/THB exchange rate is strongly influenced by the capitalization of the stablecoins BUSD, USDT and USDC. The study results are consistent with previous experimental studies. Stablecoins are a new generation of cryptocurrencies, whose value is tied to and pegged to a basket of currencies or an asset. Stablecoins will combine the advantages of conventional bank money in terms of stability in value with the advantages of cryptocurrencies that do not require transactions through bank intermediaries and, therefore, higher privacy and possibly lower transaction costs (Popper &; Isaac, 2020).

The pulse response results show that the value of SGD is strongly affected by stablecoins, while the impact of stablecoins on the value of VND is recorded lower. This result is also in line with the actual situation, the level of internationalization of SGD is much greater than that of VND, on the other hand, the Vietnamese government has not yet recognized the legality of electronic currencies. The issuance of asset-backed stablecoins is seen as the creation of money by the shadow banking system, so it could threaten the position of a strong currency with a high degree of internationalization. The emergence of stablecoins could form an international monetary system that operates not on national governments but on private businesses and even on pure algorithms, with the advantages that stablecoins will compete with existing native currencies and impact the

value of these traditional currencies. International tensions between countries have also prompted the development and use of cryptocurrencies aimed at implementing protection strategies against possible disconnection from international payment networks. This was actually one of the reasons for bitcoin's reputation and appeal in 2010, when it began to be used as an alternative to conventional payment circuits (Fantacci, 2019).

The variance decay of the VECM model is intended to separate the degree of contribution of variables in the causal relationship. The results of decay in variance are consistent with the findings of the aforementioned pulse response function analysis and, more importantly, the determination of the impact of the capitalization of stablecoins on the value of traditional currencies. Although the contribution in the value fluctuation of VND due to the volatility of stablecoins is about 1% and the contribution in the value fluctuation of THB due to the volatility of stablecoins is about more than 2%. However, the impact of stablecoins on the value of THB and VND coins lasted long after and showed no signs of fading. On the other hand, the impact of stablecoins on the value of SGD currencies is quite large, especially the capitalization of BUSD affects over 12% on the USD/SGD exchange rate. The popularity of stablecoins is a phenomenon that should also be recognized in this international context. In fact, unlike first-generation cryptocurrencies like Bitcoin, stablecoins can be a good alternative to official currencies, as their value is backed by assets or strong currencies (Carney, 2019). Stablecoins are usually pegged to a currency or a basket of currencies. Before the global pandemic and sanctions policies from politics will affect the value, purchasing power, exchange rates of official currencies. This context also makes stablecoins potentially represent a more stable currency than official currencies, if they are pegged to value assets (Fantacci, 2017).

5. Conclusions and policy implications

Thus, the research results show that the USD/SGD exchange rate is strongly influenced by the capitalization of the stablecoins BUSD and USDC. The USD/THB exchange rate is strongly influenced by the capitalization of the stablecoins BUSD, USDT, and USDC, while the impact of stablecoins on the value of VND is recorded lower. However, the impact of stablecoins on the value of THB and VND coins lasted long and showed no signs of fading. Stablecoins achieving high capitalization can have a significant impact on the relative value of currencies due to the buying and selling activity of this currency. Therefore, the choice of currency or asset and the proportion in which stablecoins attach value to that currency will determine how capitalized the stablecoins are. Stablecoins can amplify the depreciation of the strong currency to which it fixes its value. If a country's currency is depreciated sharply due to a characteristic shock, then liquidation of the stablecoin currency associated with that currency can further increase the depreciation of that currency.

Considering monetary management policies in the future, if transactions for stablecoins are acknowledged in line with integration trends, it is also possible to use additional regulatory policies to influence transactions of stablecoins, thereby impacting the value of national currencies, which can increase the capitalization of strong stablecoins. Some countries may focus on BUSD or USDC, while others may focus on all three currencies BUSD, USDT, and USDC, including Vietnam.

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