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IMPACT OF CRYPTOCURRENCY EXCHANGE RATE ON FINANCIAL STOCK EXPOSURE: COMPARISON BETWEEN TWO EMERGING MARKETS

Abstract. This research employs Capital Asset Pricing Model and foreign exchange exposure theory to explain how the value of financial stocks is affected by the home country cryptocurrency. Previous literature proposed that financial stocks were related to the economic or individual financial ratio, but rarely discussed the impact of a cryptocurrency variable in the digital economy. This paper presents specific findings to prove that cryptocurrency development causes structural change in the financial industry, by examining 67,166 panel data observations from China and Taiwan markets. We offer the following important conclusions: 1. Financial stocks in the China market suffer significantly higher impacts from home country cryptocurrency exposure than the Taiwan market. 2. Financial stocks in the China market are more greatly shocked by the CAPM three factors variables than the Taiwan market. 3. There are significant differences between the two financial markets. 4. The dynamics of the adjustment process of cryptocurrency evolution and the monetary system are key solutions for both markets.

Keywords: cryptocurrency, Fin-Tech, Exchange rate Exposure.
JEL Classification A14, D82, F65, G12, F3
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ВПЛИВ СТРУКТУРИ ОБМІНУ КРИПТОКУРСІВ НА ВИПАДКОВОСТІ ФІНАНСОВОГО СТАНУ: ПОРІВНЯННЯ МІЖ ДВОМА РИНКАМИ, ЩО РОЗВИВАЮТЬСЯ

Анотація. Використано модель ціноутворення капіталу і теорію впливу валюти, щоб пояснити, як на вартість фінансових запасів впливає криптовалюта країни походження. Попередня література передбачала, що фінансові запаси були пов'язані з економічним або індивідуальним фінансовим співвідношенням, але рідко обговорювався вплив змінної криптовалюти на цифрову економіку. Представлено конкретні висновки, щоб довести, що розвиток криптовалюти спричиняє структурні зміни у фінансовій галузі, вивчаючи 67 166 спостережень за даними панелей із ринків Китаю і Тайваню. Пропонуємо такі важливі висновки: 1) фінансові запаси на китайському ринку зазнають суттєво сильніших наслідків впливу криптовалюти у своїй країні, ніж ринок Тайваню; 2) фінансові запаси на китайському ринку більше вражені змінами трьох факторів CAPM, ніж ринок Тайваню; 3) існують суттєві відмінності між двома фінансовими ринками; 4) динаміка процесу коригування еволюції криптовалюти і грошової системи є ключовими рішеннями для обох ринків.

Ключові слова: криптовалюта, Фін-Тех, обмінний курс.
Формул: 2; рис.: 0; табл.: 4; бібл.: 31.

1. Introduction. The basis of cryptocurrency, or virtual currency, is from the block chain. An anonymous trader with transaction needs places information on a public chain and broadcasts to all participants to implement a digital certification. When all participants reach a consensus, all the contents are encrypted to form a new block, which is connected to the previous existing block and is distributed to the computers of all participants, or nodes. This is a form of financial technology (fin-tech) and has been widely applied in third-party payment systems, smart contracting systems of the insurance industry, self-service banking systems [20], new target hedging systems of the securities industry

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[5; 7; 16], as well as product traceability and electronic and digital signature. Nasdaq released the KBW Nasdaq Financial Technology Index (KFTX) to track changes in stock prices of companies that apply fin-tech, while NYSE also released NYXBT to demonstrate changes in the value of Bitcoin. All of them show the significant impact of the cryptocurrency evolution on social finance [4].

Molnár (2019) [22] and Leahy, Schich, Wehinger, Pelgin, and Thorgeirsson (2001) [26] argued that financial innovation helpsmake the use of funds in the financial industry more efficient and drives economic growth. Other studies in the literature noted that investment in cryptocurrency mitigates the risks of investment portfolios [5; 16; 17] and even make investment portfolios more efficient [7]. However, the innovation of cryptocurrency is reshaping payment methods and investment portfolios and is still bringing a great shock to conventional revenue sources, despite that the financial industry has employed some technologies to improve its market competitiveness [20]. Revenues of the financial industry mainly derive from commissions, net interest, or investment returns in compliance with laws. The financial industry is able to maintain good profits if there are stable monetary policies and no non-financial competitors. With the population of cryptocurrencies, enterprises and consumers are forming new habits and more and more transactions are being made through third-party payment platforms. As driven by community discussions, cryptocurrencies are posing an increasingly greater impact on the revenues of the financial industry [18; 24]. The financial industry will face a catastrophe if its financial service structure is broken up and its financial service technologies are interrupted [3; 19].

The cryptocurrency evolution has achieved financial innovation, reshaped the competitive landscape of financial service market, and changed the value of financial stocks in both positive and negative manners. This paper aims to discuss how to employ modelling and theoretical derivation to explain the impact of cryptocurrency on the financial market. This paper also discusse show the fluctuation of cryptocurrency value impacts cross-border financial products through transmission mechanisms according to literature deduction [17]. The answers to questions of what is the medium and how does it affect financial stocks are not yet given, but are important as they can provide a basis for the development of monetary policies. In view of the above, this paper contributes by obtaining the β value of the cryptocurrency exchange rate [11; 21] to observe its transmission to and its effect on financial stocks. Overall, this paper adds cryptocurrency exchange exposure as an independent variable to the Capital Asset Pricing Model [19], in order to review how cryptocurrency evolution changes and affects the value of financial stocks. The results from the China market and Taiwan market in Asia can be compared as these two markets hold opposite attitudes towards the governance of cryptocurrency and implement different exchange rate systems.

This study introduces exchange exposure to the Capital Asset Pricing Model (CAPM) model to observe how the transmission of cryptocurrency exchange rate affects the value of financial stocks. This paper consists of five sections in total. According to the empirical results, the conclusions of this study are that financial stocks in the China market are subject to a greater impact of cryptocurrency exchange exposure than financial stocks in the Taiwan market. In addition, the two financial markets have different structures.

2. Literature Review and Hypotheses' Development. Fin-Tech indeed affects the financial industry (World Economic Forum Annual Meeting, 2015) [31]. The theory of financial intermediation and its supporters believe that fin-tech has had positive impact on the financial industry [4; 26]. However, some studies in the literature argued that fin-tech has a negative impact on the financial industry [3; 19]. The disputes over the use of cryptocurrency, legitimacy of cryptocurrency, and different supervision systems could affect some financial markets. As time goes by, the use of cryptocurrency has spread to different levels [1; 15]. Financial markets in different regions have given different responses to cryptocurrencies, which result in different regional cryptocurrency evolutions that in turn cause structural changes in the value of financial stocks. Despite different awareness of cryptocurrencies and different financial governance systems in different countries, investors always seek fortune or evade risks. In such a case, investors are likely to purchase cryptocurrencies, such as Bitcoin, to diversify their investment portfolios and seek higher returns [7].

How do the transmission mechanism and the cause-and-effect relationship arise? Investors who purchase cryptocurrencies for purposes of investment or risk aversion must withdraw money or apply for loans from financial institutions and exchange home country currencies into

cryptocurrencies through an exchange market. Such operations are performed all the time, and the trade volume is increasing, which in turn results in a depreciation of home country currencies and accordingly poses a negative impact on the operations of the financial industry [27]. Furthermore, investors enjoy better efficiency of their investment portfolios, but their operations change the gearing ratios of banks during asset exchange, which in turn affects the value of financial stocks [9; 14]. Investors also reduce their savings, which makes the money multiplier useless, lowers the monetary base, and intensifies short-term fluctuations in interest rates, all of which are unfavorable for enterprises to make investment decisions, indirectly change economic growth, and further affect the value of financial stocks [10].

The development of cryptocurrencies affects the financial stocks in the home country through the foreign exchange market for purposes of improving the efficiency of investment portfolios. Such a deduction may be explicable. Bitcoins that are being transacted worldwide can connect to home country currencies through the operations of cross exchange rates. This makes it extremely likely to transmit the connotation of changes in the value of cryptocurrencies to the financial markets in the home countries through foreign exchange markets.

How is the connotation of changes in the value of cryptocurrencies that is transmitted to the financial stocks in the home country measured? Prior financial literature noted that multinational enterprises are subject to economic risks in global operations. The concept of exchange exposure was introduced to explain the impact of unexpected changes in exchange rates on the value of multinational enterprises [21]. For discussion purposes, the literature used a market model that is incorporated with the exchange rates in the home country and main trading countries, to obtain the value of exchange exposure, or exchange rate β value, through a regression [11; 21]. Results show that a greater exchange rate β value indicates greater impact on the value of enterprises. In view of that, this paper wants to observe how the information about changes in the value of cryptocurrencies is transmitted to the financial stocks of the home country, when the independent variable of exchange exposure is replaced with a cryptocurrency to the home country currency exchange rate, so as to discuss the impact on the value of financial stocks with the β value of the cryptocurrency exchange rate. This runs in line with the cause-and-effect relationship argued by [6] and [13] and also echoes the transmission mechanism proposed in [17]. In other words, the balance in the exchange rate of a cryptocurrency to the home country currency changes with the change in the value of the cryptocurrency.

Due to large transaction amounts and widespread legitimate use of cryptocurrencies in China, their exchange rates change quite frequently, and the values of financial stocks are also being adjusted more frequently, which result in a larger β value of the cryptocurrency exchange rate. In contrast, the legitimate status of cryptocurrencies is denied in the Taiwan market, and therefore financial stocks are subject to a minor impact of cryptocurrencies, thus inducing a smaller β value of a cryptocurrency exchange rate. Based on the preceding deduction and subject to a change in the value of cryptocurrencies, financial stocks in the China market experience greater change in the exchange rate than those in the Taiwan market. This deduction is mainly for validating this relationship.

H_0: The β value of the cryptocurrency exchange rate in the China financial market is greater than that in the Taiwan financial market.

3. Methodology.

3.1. Data sources. This paper explores the impact of the development of cryptocurrency on the exchange exposure of financial stocks in two different markets. The value of Bitcoin, which is not supported by fundamentals, is prone to sharp price movements under great impact of the general environment that could stabilize the financial market to some extent. Such a significant risk aversion effect is inexplicable. This is also a point that this paper tries to explain. Data about cryptocurrencies used in this study come from NYXBT of the New York Stock Exchange (NYSE) and financial stock data of the two emerging markets. Control variables are from Taiwan Economic Journal. Considering that these indices are released during different periods of time and available information, this study moves the research period to July 2016 — March 2019. On such a basis, after removing incomplete data and through comparisons, we collected a total of 44,727 sets of data

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on financial stocks in the China market, and a total of 22,439 sets of data on financial stocks in the Taiwan market, totaling 67,166 sets of data.

3.2 Research variables. This paper uses three-factor CAPM and adds two independent variables (cryptocurrency exchange rate and dummy variable) to compare the two markets. Its basis is similar to that of the extended models in [8; 19], and [25]. Financial stock excess return is a dependent variable and is subject to the impact of three control variables (size, BMR, and market excess return) [2; 12; 23; 29]. The β value of the cryptocurrency exchange rate and market segment variables are independent variables and are introduced in the CAPM, as described below.

Excess return ($R_i - R_f$) is obtained by deducting the market risk-free interest rate (R_f) from the increase/decrease in financial stock prices between two trading days. Size is the natural logarithm value of the market value of a financial company during the sample period. BMR is the natural logarithm value by dividing the book value of a company by its market value. Market return ($R_m - R_f$) is calculated in the same way as excess return ($R_i - R_f$), by deducting the market risk-free interest rate (R_f) from the increase/decrease in financial stock prices between two trading days. All of these factors are control variables of the model. The cryptocurrency exchange exposure value (CH) is the β value of the cryptocurrency exchange rate obtained through regression by referring to [21] and is an independent variable of the model.

3.3 Research model. This paper specifically observes the impact of the development of cryptocurrency on the value of financial stocks, by employing an extended model from the base model in [19]. We add two independent variables: fin-tech and cryptocurrency exchange rate. Data are traced and analyzed. The original model is designed as (1):

$$R_{i,t} - R_{f,t} = \alpha_0 + \beta_1\left(R_{m,t} - R_{f,t}\right) + \beta_2 ln(SIZE)_{i,t} + \beta_3 ln(BMR)_{i,t} + \\ + \beta_4\left(\frac{(Home\ Currency/Bitcoin)_t - (Home\ Currency/Bitcoin)_{t-1}}{(Home\ Currency/Bitcoin)_{t-1}}\right)_t + \varepsilon_{i,t}, \quad (1)$$

where $R_{i,t}$ is the rate of return of stock i in period t; $R_{f,t}$ is the risk-free rate of return in period t; $R_{m,t}$ is the index rate of return of the market in period t; $ln(SIZE)_{i,t}$ is the market value of the company of stock i in period t; $ln(BMR)_{i,t}$ is the BMR of stock i in period t; $\frac{(Home\ Currency/Bitcoin)_t - (Home\ Currency/Bitcoin)_{t-1}}{(Home\ Currency/Bitcoin)_{t-1}}$ denotes the change in the direct quote exchange rate of one Bitcoin to the home currency in period t; ε_t represents the residual of the model; β_i represents the coefficient of regression of the model.

The Taiwan market model and China market model are built based on the original model (1). The coefficient of individuality β_{iT} represents the coefficient of the Taiwan market model; the coefficient of individuality β_{iC} represents the coefficient of the China market model. In order to integrate and distinguish the differences of the two markets, D_1 is set as the dummy variable for the Taiwan market model, and D_2 is set as the dummy variable for the China market model. Traced data are from either the Taiwan market or China market, and therefore, $D_1 + D_2 = 1$. The Taiwan market model and China market model are further integrated into (2).

Variables are as described previously. Null hypotheses are verified. H_0: $\beta_{4T} - \beta_{4C} \geq 0$.

$$R_{i,t} - R_{f,t} = \alpha_{0C} + (\alpha_{0T} - \alpha_{0C})D_1 + \beta_{1C}R_{m,t} + (\beta_{1T} - \beta_{1C})D_1(R_{m,t} - R_{f,t}) + \\ + \beta_{2C} ln(SIZE)_{i,t} + \\ + (\beta_{2T} - \beta_{2C})D_1 ln(SIZE)_{i,t} + \beta_{3C}(BMR)_{i,t} + (\beta_{3T} - \beta_{3C})D_1(BMR)_{i,t} + \\ + \beta_{4C}\left(\frac{\left(Home\frac{Currency}{Bitcoin}\right)_t - \left(Home\frac{Currency}{Bitcoin}\right)_{t-1}}{\left(Home\frac{Currency}{Bitcoin}\right)_{t-1}}\right)_t + (\beta_{4T} - \beta_{4C})D_1\left(\frac{\left(Home\frac{Currency}{Bitcoin}\right)_t - \left(Home\frac{Currency}{Bitcoin}\right)_{t-1}}{\left(Home\frac{Currency}{Bitcoin}\right)_{t-1}}\right) + \\ + \varepsilon_{i,t}, \quad (2)$$

4. Results and Analysis.

4.1. Basic descriptive statistics. There are five variables in this study: the financial stocks' excess return ($R_i - R_f$), the market value ratio (BMR), the market's excess return ($R_m - R_f$), the individual stocks' size (SIZE), and the home country cryptocurrency exchange rate (CH). The basic statistics include Mean, Median, Maximum, Minimum, Std. Dev, Skewness, Kurtosis, and Jarque-Bera and are shown in Table 1. Taking the Taiwan market as an example, the average return of financial stocks ($R_i - R_f$) is -0.009860, the maximum value is 0.315264, and the skew coefficient is 2.6967713. The median of CH is 0.002968, the maximum value is 0.330835, and the kurtosis coefficient is 9.812504. In the China market, the average return of financial stocks ($R_i - R_f$) is -0.010578, the maximum value is 0.430341, and the skew coefficient is 2.696713. The median of CH is 0.001241, the maximum value is 0.333780, and the Jarque-Bera coefficient is 4430194. The remaining variables are shown in *Table 1*.

Table 1

Basic Statistics

This table describes all basic statistics in both markets, including ($R_i - R_f$), BMR, ($R_m - R_f$), (SIZE), and (CH).

Taiwan Market	$(R_i - R_f)$	BMR	$(R_m - R_f)$	SIZE	CH
Mean	-0.009860	1.167762	0.000282	10.79667	0.002398
Median	-0.010450	1.159330	-0.000260	10.55654	0.002968
Maximum	0.315264	2.686562	0.332506	13.47454	0.330835
Minimum	-0.109588	0.384637	-0.072392	6.901737	-0.200288
Std. Dev.	0.009776	0.337082	0.009657	1.547419	0.045443
Skewness	2.696713	0.625405	3.358225	-0.401509	0.405190
Kurtosis	72.57218	4.644570	79.55708	2.474632	9.812504
Jarque-Bera	4552664.	3991.464	5521955.	860.9564	44005.62
N 22,439					

China Market	$(R_i - R_f)$	BMR	$(R_m - R_f)$	SIZE	CH
Mean	-0.010578	0.651098	-0.010573	12.27325	-0.420796
Median	-0.011000	0.650205	-0.012175	12.07251	0.001241
Maximum	0.430341	22.36493	0.460421	19.67318	0.333780
Minimum	-0.111806	-5.094659	-0.126942	8.334485	-24.29679
Std. Dev.	0.025626	0.773087	0.022192	1.564123	2.585622
Skewness	2.679029	-2.371084	4.159578	1.079325	-6.741936
Kurtosis	45.04139	35.00027	75.31438	5.778230	49.85485
Jarque-Bera	3347420	1950294.	9874561	23068.58	4430194.
N 44,727					

4.2. Panel data regression model. The Hausman test should be conducted to track data regression before panel analysis. If the results of the Hausman value reject null hypothesis, then in this paper the fixed effect model shall be used for estimation. It is found after the Hausman statistics test that the m-values (Chi-Sq Statistic) of the full model of Taiwan and China markets both reject the null hypothesis — namely, the fixed effect shall be selected for the panel regression model for the coefficient estimations in this study.

Model A in *Table 2* represents CAPM for the Taiwan market. According to the results of the coefficient of regression, only Intercept, BMR, and ($R_m - R_f$) are significant, while SIZE is insignificant. After introducing the exchange rate of cryptocurrency to TWD into Model B, its exchange exposure is -0.00714 ($p < 0.01$), which indicates that when the exchange rate of cryptocurrency to TWD changes by one unit, the change will be transmitted to the financial stocks in Taiwan through the foreign exchange market, and the value of financial stocks in Taiwan will accordingly decrease by 0.7% (negative).

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Table 2

Panel Regression Model on the Taiwan Market

This table model lists the cross-section fixed regression results of the Taiwan market. There are two models, and the dependent variables and independent variables are described in the Taiwan and China characteristic

equation: $R_{i,t} - R_{f,t} = \alpha_0 + \beta_{1T} ln(BMR)_{i,t} + \beta_{2T} (R_{m,t} - R_{f,t}) + + \beta_{3T} ln(SIZE)_{i,t} + \beta_{4T}(CH)_{i,t} + \varepsilon_{i,t}$

Dependent Variable: $(R_i - R_f)$	Taiwan Market			
	Model A		Model B	
Independent Variables	Coefficient	t-Statistic	Coefficient	t-Statistic
Intercept	-0.00997***	-53.41454	-0.00949***	-9.84750
BMR	-0.00020***	-3.079044	-0.00078***	-2.73594
$(R_m - R_f)$	0.68238***	305.6492	0.68241***	136.598
SIZE	1.44E-05	1.007650	3.49E-05	0.43029
CH			-0.00714***	-6.72908
Adjusted R^2	0.454480		0.45493	
F-statistic	13353.90***		11735.27***	
N	22,439			

According to Model A for the China market in *Table 3*, all variables of CAPM for the China market are significant, which is different from that of the Taiwan market. After introducing the exchange rate of cryptocurrency to RMB into Model B, its exchange exposure value is +0.00693 ($p < 0.01$), which indicates that when the exchange rate of cryptocurrency to RMB changes by one unit, the value of financial stocks in China will accordingly increase by 0.6% (positive), which is in contrast with the empirical result for the Taiwan market. Overall, this difference should be attributable to different cryptocurrency governance systems and cryptocurrency transaction amounts in the two markets, implying that the transmission of cryptocurrency through the foreign exchange market changes the value of financial stocks in the home country. This argument is first proposed in this study. The research result also echoes the research results of [6; 13; 17].

Table 3

Panel Regression Model on the China market

This table model lists the cross-section fixed regression results of the China market. There are two models, and the dependent variables and independent variables are described in the China characteristic

equation: $R_{i,t} - R_{f,t} = \alpha_0 + \beta_{1c} ln(BMR)_{i,t} + \beta_{2c}(R_{m,t} - R_{f,t}) + \beta_{3c} ln(SIZE)_{i,t} + + \beta_{4c}(CH)_{i,t} + \varepsilon_{i,t}$

Dependent Variable: $(R_i - R_f)$	China Market			
	Model A		Model B	
Independent Variables	Coefficient	t-Statistic	Coefficient	t-Statistic
Intercept	-0.00266***	-8.708781	-0.00367**	-8.589213
BMR	-0.00083***	-11.45545	-0.00156***	-11.13259
$(R_m - R_f)$	0.95454***	694.9762	0.95338***	694.7838
SIZE	0.00023***	8.556965	0.00035***	8.324303
CH			0.00693***	10.63806
Adjusted R^2	0.68366		0.68352	
F-statistic	69045.08***		60458.90***	
N	44,727			

***p < 0.01.

4.3. Robustness analysis. Table 4 lists the panel regression model analysis that integrates the two markets. Model A shows all coefficients of research variables are significant when the data are pooled into the panel regression. This study now needs to know whether the research hypotheses are true. Table 4 Model B lists the regression model analysis that integrates data from the Taiwan and China markets. From the variable D1*CE of *Table 4*, the influence of the home country cryptocurrency exchange rate (CH) on the value of financial stocks in the China market is relatively large. The regression coefficient (-0.0070, p < 0.01) shows that the financial stocks in the Taiwan market are marginally negatively affected by the home country cryptocurrency exchange rate versus the China market; that is, the null hypothesis of $H_0: \beta_{4T} - \beta_{4C} \geq 0$ is rejected. In other words, crypto-NT exposure of Taiwan financial stocks is smaller than China financial stocks when the

cryptocurrency value impacts the foreign exchange market during the research period. It can be seen from all data regression coefficients *D*1, *D*1*$(R_m - R_f)$, *D*1* BMR, and *D*1* SIZE in Table 4 that the structure of the two markets is significantly different. Finally, the Adjusted R^2 and F values are significant, indicating that the model has good predictive power. Please refer to the results of *Table 4* for the remaining panel regression coefficients. General speaking, after comparing the two markets' empirical analysis with panel data regression, the coefficients show that China's fixed exchange rate and clear monetary governance system causes it to have higher cryptocurrency exposure than the Taiwan market with its floating exchange system and no governance policy on cryptocurrency. Even so, based on the cryptocurrency evolution, policy dynamics of monetary system are possible key solutions for both markets, if fiscal policy of the government is followed.

Table 4

Market Integration Regression Model

The model depends on the dependent variables and the independent variables, as follows: $R_{i,t} - R_{f,t} = \alpha_{2C} + (\alpha_{1T} - \alpha_{2C})D_1 + \beta_{1C}R_{m,t} +$
$+(\beta_{1T} - \beta_{1C})D_1(R_{m,t} - R_{f,t}) + \beta_{2C}ln(SIZE)_{i,t} + (\beta_{2T} - \beta_{2C})D_1 ln(SIZE)_{i,t} + \beta_{3C}(BMR)_{i,t} + (\beta_{3T} - \beta_{3C})D_1(BMR)_{i,t} + \beta_{4C}(CH)_t +$
$+(\beta_{4T} - \beta_{4C})D_1(CH)_t + \varepsilon_{i,t}$

Dependent Variable: $(R_i - R_f)$	All Markets			
	Model A		Model B	
Independent Variable	Coefficient	*t*-Statistic	Coefficient	*t*-Statistic
Intercept	-0.00263***	-8.589213	-0.00268***	-14.29477
BMR	-0.00080***	-11.13259	-0.00084***	-18.85328
SIZE	0.00022***	8.324303	0.00023***	14.10112
$(R_m - R_i)$	0.95424***	694.7838	0.95454***	1135.217
CH	0.00692***	10.63806	2.02E-05***	2.789995
D1			-0.00727***	-24.64632
D1*BMR			0.00064***	7.059384
D1*SIZE			-0.0002***	-9.134100
D1*$(R_m - R_f)$			-0.2718***	-95.20044
D1*CH			-0.0070***	-12.19506
Adjusted R-squared	0.68381		0.668231	
F-statistic	60458.90***		150314.3***	

5. Conclusion and Suggestions. Under the framework of CAPM and cryptocurrency currency evolution, this study explores the impact of the home country cryptocurrency exchange rate (CH) on the prices of financial stocks. After experimental design and panel model analysis, this paper supports some important findings as follows. The research hypothesis verifies that financial stocks in China are affected by the crypto-RMB exchange rate more than the impact of the crypto-NT exchange rate on Taiwan's financial stocks. Introducing CH can help to understand the competitive position; that is, the null hypothesis$(H_0: \beta_{4T} - \beta_{4C} \geq 0)$ is rejected, but the opposite hypothesis $\beta_{4T} - \beta_{4C} \leq 0$ is accepted. Due to clear financial governance in the China market, third-party payments and block chain development are flourishing and are more affected by exposure to the crypto-RMB exchange rate. In contrast, the Taiwan market does not recognize the environment of cryptocurrency or third-party payments. The introduction of crypto-NT exchange rate exposure thus has relatively small and negative impact on financial stocks. The financial stocks in the China market are more greatly shocked by the CAPM traditional variables of SIZE and $(R_m - R_f)$, but not BMR.

This paper observes the impact of CAPM and the home country cryptocurrency exchange rate on the prices of financial stocks in two different markets. In terms of the panel regression results, financial stocks in the China and Taiwan markets are more driven by the crypto-home exchange rate. Thus, the impact of cryptocurrency development and the impact of regional risks on financial stocks cannot be ignored [30]. In addition, the panel regression result of *Table 4* shows that there is a clear

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difference in the financial condition and environment development between the two markets. This model compares two emerging Asian markets. The phenomena of financial services disruption and innovation diffusion, as discussed by [19; 24; 26; 28], may also alter the values of financial stocks in different markets. It is suggested that future research can conduct in-depth analysis on this topic. Finally, the dynamics of the adjustment process of the cryptocurrency evolution and monetary systems are key to formulating crypto-commodities policy making for both markets.

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