

# Bank Risk Assessment Via An Econometric Model – A Case Of Acb Bank In Vietnam

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## ABSTRACT

Our paper objective is to analyze and measure effects of multi factors (internal and external ) on both beta CAPM and cost of equity of CB commercial bank in Vietnam market. We also add market return, market risk premium an tax rate into this econometric model.

By using OLS regression which is a reliable method, our research results tell that firstly, Because 3 factors beta, Rf and MRPremium have positive corr with cost of equity: A reduction of Rf and beta will reduce cost of equity and expected return.

Next, because R, IM and Rf have positive impact on beta ACB while G and MRPremium have positive corr in pre L inflation time but negative corr in post L inflation stage: we suggest increasing industrial manufacturing (IM) and Rf to reduce market risk (beta) during post Low inflation stage.

Therefore, our study can be expanded for other markets.

**Key words:** effects, risk policies, Vietnam banks, beta CAPM.

**JEL:** M21, G30, G32, G38

## 1.Introduction

First, we recognize the importance of digital data in risk management function in banking also increase to a new level in recent years.

Next, we see business results of ACB commercial bank in Vietnam over past years:

Enterprise Asia considers ACB to be an enterprise with a business strategy for sustainable development, good growth and outstanding business results, in addition to many community activities and contributions to society.

Enterprise Asia also said that ACB is a valuable banking brand in Vietnam's finance and banking industry. ACB's products and services have a positive impact on the community and are trusted, chosen and supported by consumers and the public.

The Asia Pacific Enterprise Awards (APEA) was initiated by Enterprise Asia over the past 10 years and is now a prestigious award system recognized by Enterprise Asia. Held annually in 14 countries.

ACB has just released its consolidated financial statements for the third quarter of 2020 showing that risk provision expenses increased 24 times over the same period, but profit before tax this quarter reached 2,592 billion dong.

Accumulated in the first 9 months of 2020, ACB reached VND 6,411 billion before tax. By the end of the third quarter, ACB's total assets increased by 9% compared to the beginning of the year, reaching more than VND 418,748 billion.

Outstanding loans to customers increased by 10.7% to 297,385 billion VND. Customer deposits increased by 9% to VND 334,729 billion.

By the end of September 30, ACB recorded nearly VND 2,480 billion of bad debt, up 71% compared to the beginning of this year. In which, group 3 debt increased 3.5 times to 831 billion dong; Group 4 debt increased 75% to 543 billion dong; Group 5 debt increased 22% to 1,105 billion VND.

(source: [tinnhanhchungkhoan.vn](http://tinnhanhchungkhoan.vn), access date 29/3/2022)

Then, Imran et al (2021) stated that In the current situation, one of the most contemporary issues in advance corporate finance and financial economics is the magnitude of equity premium in the total returns of an investment. The equity premium is the additional return that investors necessitate from investing in riskier stocks rather than risk-free securities. Equity (risk) premium drives the total expected stock returns and is a key determinant of the cost of equity.

Next, Luwihono et al (2021) said Investment decision making by Engineering Managers needs to take into account microeconomic and macroeconomic factors in a country. The role of Engineering Managers in making decisions is crucial and very important. Technical Managers need to consider macro-economic effects such as the US dollar exchange rate against the rupiah, the interest rate set by Bank Indonesia, inflation, especially during the preparation of the Budget Plan (RAB)

In this paper we will consider to measure effects of market return and market risk premium on beta CAPM and cost of equity of a single big listed bank, Asia commercial bank (ACB) in Vietnam.

**Research questions:**

Question 1: Explain econometric model of measuring multi factors effects on beta CAPM of ACB bank?

Question 2: Measuring effects of market risk premium , beta and other factors on cost of equity of the selected bank?

Question 3: Present any risk policies we can derive?

**2. Literature review**

First, Gupta (2019) specified that Information system (IS) is important in almost all the functional areas of any bank i.e. HR, Marketing, Finance, etc. It also helps in risk management and cash management along with maintaining long run customer relationship. Second, Huy, D.T.N (2015) stated important role of risk management in corporate governance model of firms.

And Kien Le and Nguyen, M. (2021) also stated it is important for education.

Then, We summarize previous studies as follows:

**Table 1 – Summary of previous studies**

<b>Authors</b>	<b>Year</b>	<b>Contents, results</b>
Ohlson	1995	The model (Ohlson, 1995) is the most well-known value model for the connection between business value and accounting. Ohlson's model is also an accounting model itself that includes a model that covers key values of financial intelligence. The model of Ohlson is a strong theoretical market evaluation framework that is based on basic accounting and other information related to corporate value prediction. The model is simple, in the Model investors are assuming that they are neutral, accounts are non-biased, there is no clear surplus, the role in accounting is

		not detailed, there is no asymmetry of information, inconsistency of tax rates, explicitly calculated actual choices and an abnormal profit and "v" self-record.
Karim, A.J	2011	Management Information Systems (MIS) is the key factor to facilitate and attain efficient decision making in an organization.
Avegrou, C.	2008	Information system (IS) in emerging markets research has expanded the IS research agenda and developed new understanding of IS innovation phenomena
Yang	2017	The operation of financial markets, the design and pricing of financial derivatives, and the analysis and management of risk become very important, and the research and development of financial mathematics is becoming more and more important.
Giebe et al	2019	a progressive tool for providing customer-oriented services and products, in the banking sector, is currently defined as “Big Data & Analytics”.
Johnson	2020	highlights the significance of financial practice in establishing mathematical criteria relating to judgement in the presence of uncertainty.
Hac LD et al	2021	Vietnam banks consider to enhance risk management model in recent years
Dat PM et al	2020	There are standards for risk management in firm governance
Huy, D.T.N, Hang, N.T	2021	Risk management can be done at banks with econometric model

Luwihono et al	2021	Results of the test show a positive and significant statistical effect of rupiah's exchange rate against the US dollar at a 5 percent share price, while the BI, inflation, interest rates have nothing to do with stock prices. Results of the research will provide potential investors or investors or with a more careful approach to considering U.S. dollar exchange rate aspects of rupiah as an investment in terms of stock prices in connection with the conclusions. The study's results will be used by banking firms in their business choices, in particular macroeconomics decisions in terms of share prices. Business decisions focus on how far bank returns are provided and the way in which banks maintain capital levels and corporate liquidity to allow investors to become interested in the business.
Saucedo & Gonzalez	2021	Results indicate that classic FFM variables are statistically significant in most cases, but relevant macroeconomic variables such as the interest rate, exchange rate and country risk stand out for being weakly relevant in most of the portfolios

**(source: author synthesis)**

Next, Imran et al (2021) mentioned that found that the market premium and the interest rate factors are significantly affecting the industry equity premium of all the nonfinancial sectors. However, there exists a positive effect of other macroeconomic variables such as money supply, foreign direct investment, and industrial production which is different for the different sectors based on its nature of product and services they offered.

### 3. Methodology

#### Method and Data

This study mainly use combination of quantitative methods via multi factor econometric model and qualitative methods including synthesis, inductive and explanatory methods.

Authors also use experiences and observations for conducting analysis.

For quantitative analysis, the study is supported with OLS regression.

Data is collected from reliable internet sources and websites.

**Looking at descriptive statistics below, we see that:**

- Figure 1: shows std.dev of R and tax rate are lowest
- Figure 2: shows std. Dev of beta is lowest
- Figure 3: shows corr between beta and SP500 higher than trade balance and beta
- Figure 4: shows corr between market risk premium and beta higher than between beta and CPI

**Figure 1 - Descriptive stat internal factors**

	COSTOFE	BETAACB	CPI	G	IM	MARKETR	MRPREMIUM	R	RF	TAXRATE	VINDEX
Mean	0.492000	0.990000	0.028000	0.057983	166.6841	0.540000	0.500667	0.095217	0.040000	0.203333	823.8875
Median	0.382500	0.805000	0.030200	0.065200	150.4048	0.468500	0.419000	0.095000	0.040000	0.200000	858.8200
Maximum	1.407000	3.370000	0.047400	0.070800	267.2900	1.302000	1.290000	0.110000	0.060000	0.220000	1067.500
Minimum	0.228000	0.400000	0.006300	0.018100	127.3000	0.219000	0.169000	0.090000	0.010000	0.200000	579.0300
Std. Dev.	0.328251	0.786789	0.012080	0.017170	42.17328	0.265979	0.276771	0.010451	0.016514	0.007785	170.7379
Skewness	1.920362	2.524943	-0.262708	-1.467570	1.446614	2.024211	1.998989	-0.011162	-0.252982	1.788854	-0.230870
Kurtosis	6.123752	8.372413	2.206974	3.807463	3.903310	6.928569	6.801886	1.815576	2.000000	4.200000	1.585761
Jarque-Bera	12.25449	27.18209	0.452476	4.633522	4.593369	15.91168	15.21908	0.701679	0.628000	7.120000	1.106638
Probability	0.002183	0.000001	0.797528	0.098592	0.100592	0.000351	0.000496	0.704097	0.730519	0.028439	0.575038
Sum	5.904000	11.88000	0.336100	0.695800	2000.209	6.480000	6.008000	1.142600	0.480000	2.440000	9886.650
Sum Sq. Dev.	1.185234	6.809400	0.001605	0.003243	19564.44	0.778196	0.842623	0.001201	0.003000	0.000667	320665.7

(source: author analysis with Eview)

**Figure 2 - Descriptive stat external factors**

	BETAACB	EX_RATE	SP500	TRADEBA...
Mean	0.990000	22809.67	2670.148	-28.85000
Median	0.805000	22923.00	2590.230	-100.0000
Maximum	3.370000	23230.00	3703.060	410.0000
Minimum	0.400000	21780.00	2043.940	-600.0000
Std. Dev.	0.786789	427.6367	513.0916	355.7904
Skewness	2.524943	-1.235511	0.526233	0.045436
Kurtosis	8.372413	3.825801	2.340080	1.852065
Jarque-Bera	27.18209	3.393948	0.771590	0.663006
Probability	0.000001	0.183237	0.679910	0.717844
Sum	11.88000	273716.0	32041.77	-346.2000
Sum Sq. Dev.	6.809400	2011605.	2895893.	1392455.

(source: author analysis with Eview)

**Figure 3 - Corr matrix eternal factors**

Correlation Matrix				
	BETAACB	EX RATE	SP500	TRADEBA...
BETAACB	1.000000	0.012415	-0.040497	-0.141929
EX RATE	0.012415	1.000000	0.686922	0.494357
SP500	-0.040497	0.686922	1.000000	0.866413
TRADEBA...	-0.141929	0.494357	0.866413	1.000000

(source: author analysis with Eview)

**Figure 4 - Corr matrix internal factors**

Correlation Matrix											
	COSTOFE	BETAACB	CPI	G	IM	MARKETR...	MRPREMIUM	R	RF	TAXRATE	VNINDEX
COSTOFE	1.000000	0.334446	0.164136	-0.377754	-0.168089	0.829095	0.831605	-0.319485	-0.632067	-0.167202	0.531913
BETAACB	0.334446	1.000000	0.301399	0.015720	0.399440	-0.223717	-0.217378	0.010349	0.026687	-0.089052	0.049427
CPI	0.164136	0.301399	1.000000	0.084484	0.413573	0.044033	0.063683	-0.414518	-0.243796	-0.707927	0.410282
G	-0.377754	0.015720	0.084484	1.000000	0.183920	-0.515443	-0.522605	-0.269621	0.483805	0.056223	-0.056199
IM	-0.168089	0.399440	0.413573	0.183920	1.000000	-0.415068	-0.407101	0.092178	0.127750	-0.163191	0.004536
MARKETR...	0.829095	-0.223717	0.044033	-0.515443	-0.415068	1.000000	0.998988	-0.301768	-0.681740	-0.193176	0.514370
MRPREMIUM	0.831605	-0.217378	0.063683	-0.522605	-0.407101	0.998988	1.000000	-0.327596	-0.713634	-0.207865	0.542624
R	-0.319485	0.010349	-0.414518	-0.269621	0.092178	-0.301768	-0.327596	1.000000	0.618393	0.549008	-0.876653
RF	-0.632067	0.026687	-0.243796	0.483805	0.127750	-0.681740	-0.713634	0.618393	1.000000	0.424264	-0.823647
TAXRATE	-0.167202	-0.089052	-0.707927	0.056223	-0.163191	-0.193176	-0.207865	0.549008	0.424264	1.000000	-0.650696
VNINDEX	0.531913	0.049427	0.410282	-0.056199	0.004536	0.514370	0.542624	-0.876653	-0.823647	-0.650696	1.000000

(source: author analysis with Eview)

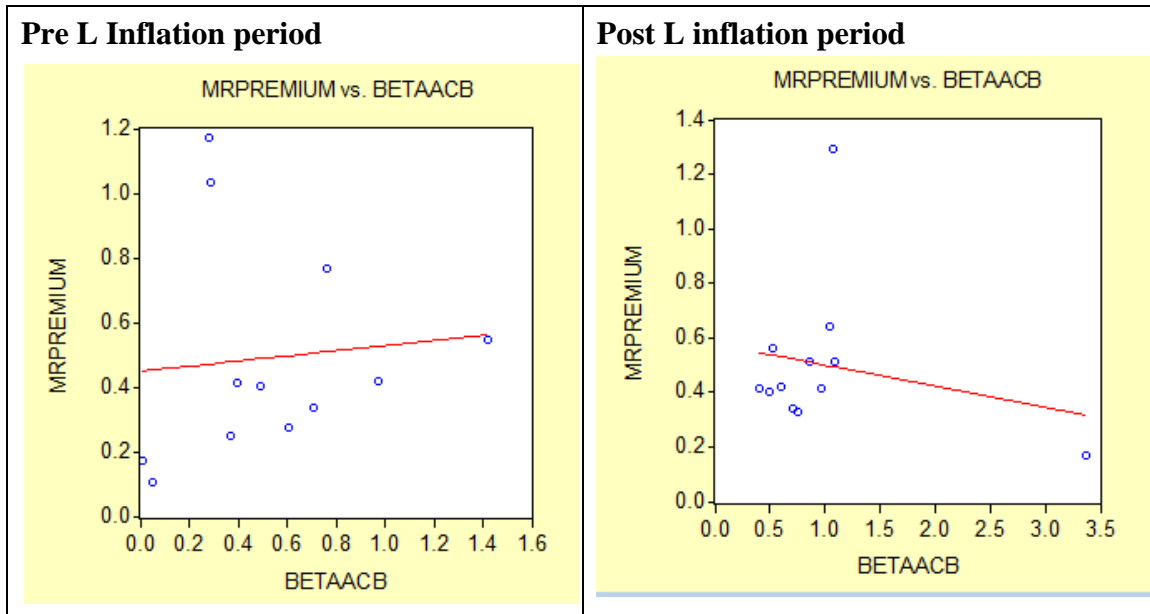
## 4. Main results

### 4.1 Overall results

We analyze from below charts that:

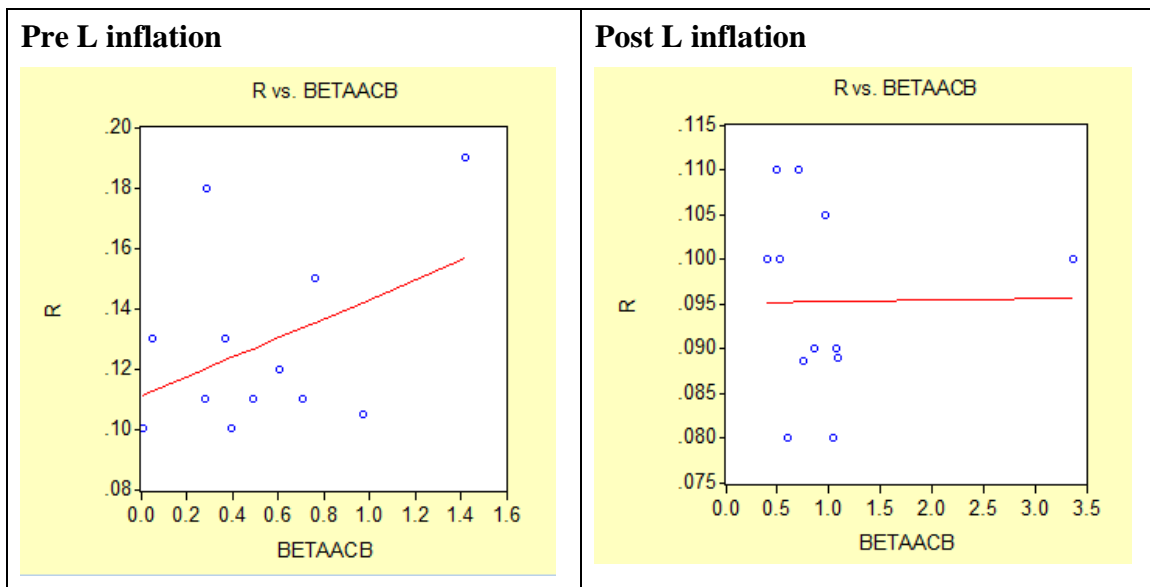
- **Chart 1:** between beta and market risk premium, negative corr in post low (L) inflation stage but positive corr in pre-L inflation period
- **Chart 2:** between beta and lending rate R, higher positive corr shown in pre-L inflation stage (compared to post L stage)
- **Chart 3:** between CPI and beta, positive corr in post L inflation time, but negative corr in pre-L inflation period
- **Chart 4:** between cost of equity and beta, higher positive corr shown in pre-L inflation stage (compared to post L stage)

### Chart 1 - MRpremium and beta in 2 stages



(source: author analysis with Eview)

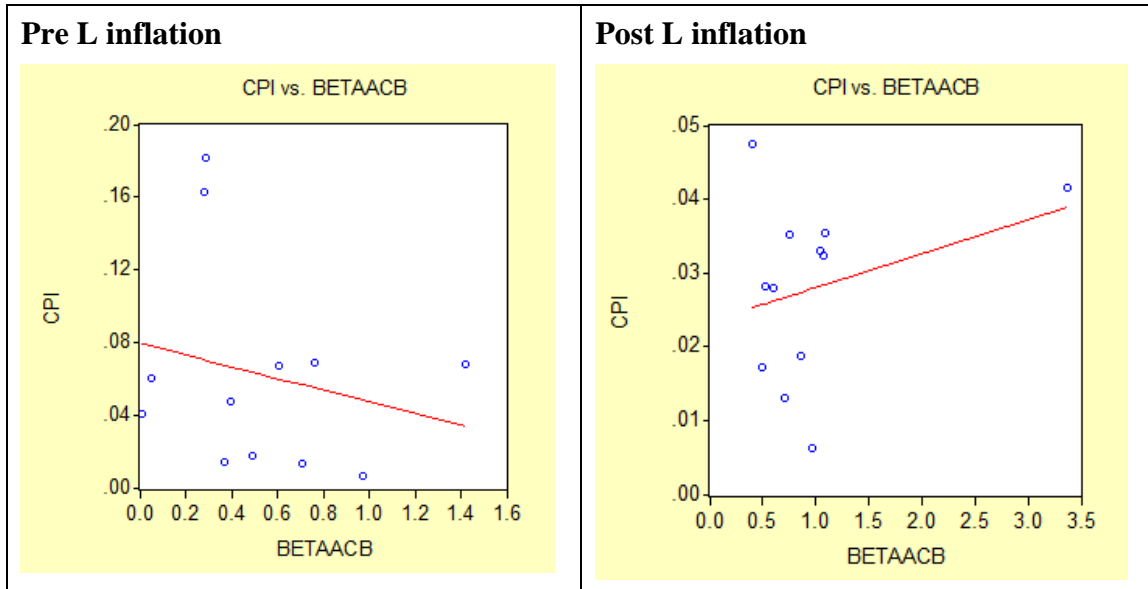
**Chart 2 - R and beta in 2 stages**



(source: author analysis with Eview)

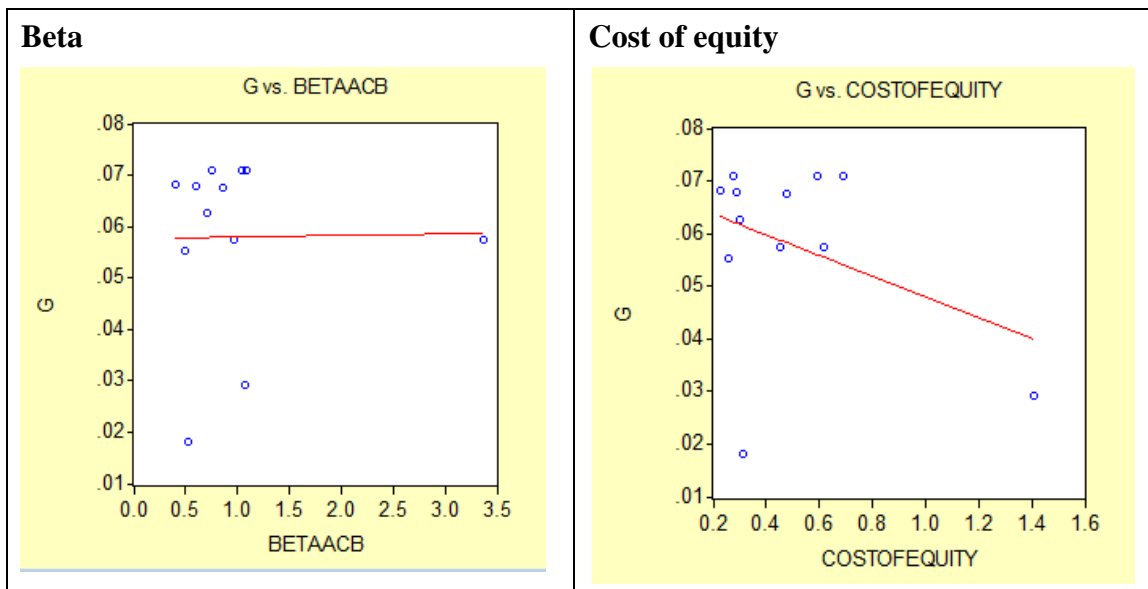


**Chart 3 - CPI and beta in 2 stages**



(source: author analysis with Eview)

**Chart 4 - Corr with GDP growth G**



(source: author analysis with Eview)

**4.2 OLS Regression results**

#### 4.2.1 OLS results for Beta ACB

We analyze from below figures:

- Figure 5: MRPremium have negative impact on beta in single model, while positive impact on cost of equity
- Figure 6: Market return has negative impact on beta , whereas positive impact on cost of equity

#### Figure 5 - Single OLS for Beta

Dependent Variable: BETAACB  
 Method: Least Squares  
 Date: 03/29/22 Time: 16:42  
 Sample: 1 12  
 Included observations: 12

Variable	Coefficient	Std. Error	t-Statistic	Prob.
MRPREMIUM	-0.617952	0.877458	-0.704252	0.4973
C	1.299388	0.497052	2.614189	0.0259
R-squared	0.047253	Mean dependent var		0.990000
Adjusted R-squared	-0.048021	S.D. dependent var		0.786789
S.E. of regression	0.805458	Akaike info criterion		2.556201
Sum squared resid	6.487633	Schwarz criterion		2.637019
Log likelihood	-13.33721	F-statistic		0.495970
Durbin-Watson stat	2.472918	Prob(F-statistic)		0.497348

(source: author analysis with Eview)

#### Figure 6 - Single OLS for Beta

Dependent Variable: BETAACB  
 Method: Least Squares  
 Date: 03/29/22 Time: 16:44  
 Sample: 1 12  
 Included observations: 12

Variable	Coefficient	Std. Error	t-Statistic	Prob.
MARKETRETURN	-0.661774	0.911718	-0.725854	0.4846
C	1.347358	0.544327	2.475275	0.0328
R-squared	0.050050	Mean dependent var		0.990000
Adjusted R-squared	-0.044946	S.D. dependent var		0.786789
S.E. of regression	0.804276	Akaike info criterion		2.553262
Sum squared resid	6.468593	Schwarz criterion		2.634080
Log likelihood	-13.31957	F-statistic		0.526864
Durbin-Watson stat	2.479410	Prob(F-statistic)		0.484569

(source: author analysis with Eview)

#### 4.2.2 OLS for ACB Cost of equity

(source: author analysis with Eview)

Table 2 – Impacts of 8 factors on Cost of Equity

	Post L infaltion
Beta	0.24
MRPremium	1.29
Rf	-3.3
CPI	-1.8
G	5.3
IM	0.0002
R	2.51
VNIndex	-0.0002
C	-0.62
R squared	0.99
SER	0.02

(source: author analysis with Eview)

#### **4. Discussion**

- Beta, Market risk premium and IM have positive corr with cost of equity while CPI and VNIndex have negative corr (table 2) in 2 stages
- For external factors, there is opposite trend: negative corr in post L time and positive corr in pre L time, for trade balance and exchange rate impact on cost of equity.

#### **5. Conclusion**

##### **Risk Management Information System (RMIS) implications**

Because 3 factors beta, Rf and MRPremium have positive corr with cost of equity: A reduction of Rf and beta will reduce cost of equity and expected return.

Next, because R, IM and Rf have positive impact on beta ACB while G and MRPremium have positive corr in pre L inflation time but negative corr in post L inflation stage: we suggest increasing industrial manufacturing (IM) and Rf to reduce market risk (beta) during post L inflation stage.

Mukhamadeev et al (2019) stated that the role of information systems for entrepreneurship education in developing countries on the example of the Azerbaijan education system and Internet banking.

Also, TD Thang, DTN Huy, PA Dung, LN Nuong, DTN Hien. (2024) mention leadership roles of Vietnam bank via a case of BIDV and use econometric model to measure macro impacts.

Saucedo & Gonzalez (2021) mentioned that Fama–French model (FFM) has been successful in helping to predict the financial markets, but investors have been interested in creating more sophisticated models to better predict the performance of the stock market. The objective of the extended version is to create a more robust econometric model to better predict the performance of the Mexican Stock Market.

##### **Limitation of research**

We can expand our research model for other industries and other markets.

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