

Risk Management via Measuring Impacts of Micro and Macro Economic Factors on Financial Firm Stock Price - A Case of Mitsubishi UFJ in Japan

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ABSTRACT

The purpose of paper is to estimate multi factors effects on stock price of a leading financial company in Japan, called Mitsubishi UFJ (MUFJ). Methods authors use is qualitative and quantitative methods with support of OLS regression via Eview. We figure out cost has negative relation with stock price Y and net sale, GDP growth have positive correlation with stock price. Hence, policy implication will be increasing economic and GDP growth and reduce CPI. Beside, inflation or CPI and lending rate need to be controlled more properly. Limitation research is that we need to expand research models for other markets.

Keywords

MUFJ Stock Price, GDP Growth, Inflationary, Risk Free Rate, Market Interest Rate.

JEL: M21, N1.

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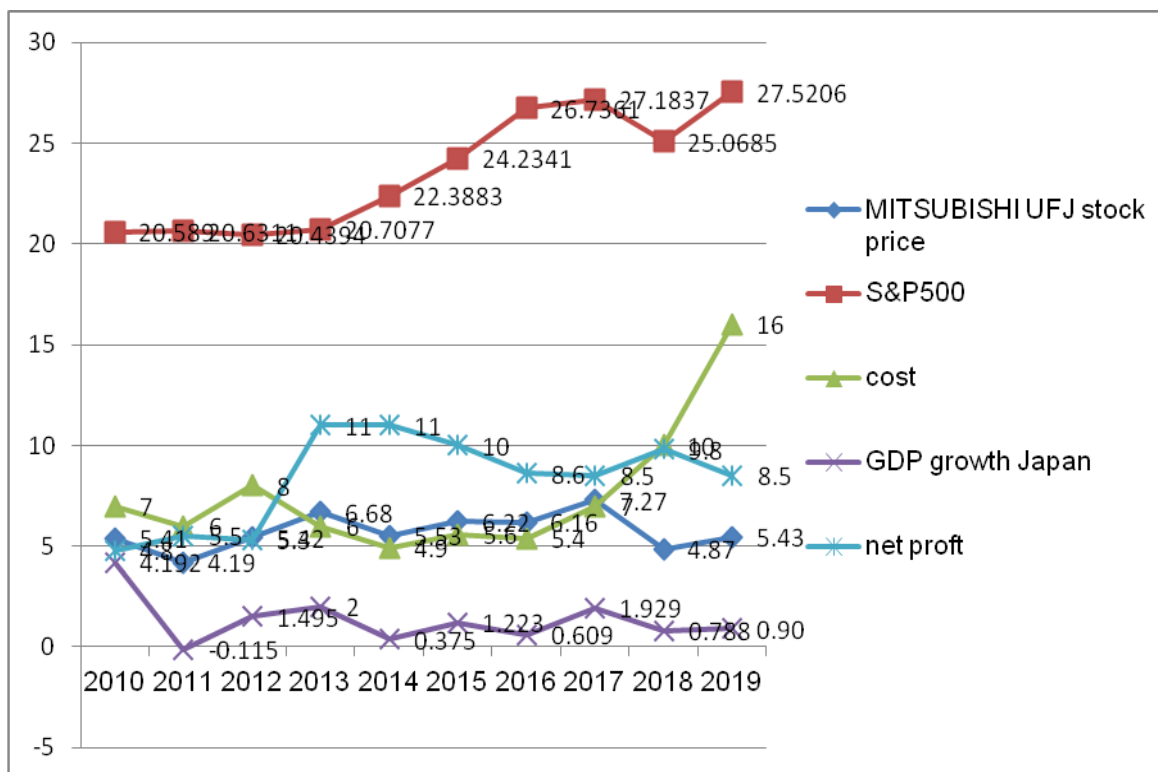
Introduction

In Tokyo Japan, there is many leading financial groups among them is Mitsubishi UFJ Financial Group, Inc. (MUFG) having 3,000 locations in more than 50 countries.

In term of environment protection and clean energy projects: as of the end of June 2019, the Trust Bank has invested more than ¥10 billion in solar power plants throughout Japan. Through these investments, these plants are expected to supply power to approximately 10,000 households a year as well as offset approximately 25,000 tons of CO₂ emissions annually. Moreover, in February 2019, the Trust Bank released part of its solar power generation portfolio as a fund for domestic institutional investors.

Commercial bank and financial group system in Japan in recent years plays a key role in helping the whole economy. In the context that GDP growth in Japan has little decreased and CPI goes down in 2018-2019, it is necessary to evaluate impacts of seven (7) internal and external macro economic factors on MUFJ performance, esp. firm stock price. From these analytical results, we could suggest bank and government policies to encourage and stabilize the growth of bank and financial system and stock market.

Below chart shows that smaller range in MUFJ stock price variation.



With reliable data, multi macro factors effects will be addressed.

The paper is organized with introduction, questions, previous studies, and methodology. Next, main research findings/results, discussion and conclusion.

Previous Studies

Research Questions

We will cover:

Question 1: What are solutions for risk management based on analysis of effects of most micro and macro economic factors: on MUFJ stock price.

Literature Review

Manisha and Shikha (2014) stated that between bank index and GDP growth, Inflation, there is positive relationship. Then, Winhua and Meiling

(2014) confirmed that banks power of earning affected by macroeconomic with great influence.

Kulathunga (2015) stock exchange much affected by most macroeconomic factors in Sri Lanka.

And Karim (2011) pointed that for decision making, the key factor is Management Information Systems (MIS).

Next, Danescu et al (2015) found out the firm objectives can be affected by risk management with proper control system and leadership.

And Nie (2017) stated that organizations need to get involvement of employee to build internal control and audit. In China firm, there is internal audit and internal control integration. When the firms are strict to internal audit, they can help to reduce risks of business.

Then, Oussii and Taktak (2018) found out between quality of internal control and IAF

competence, quality of internal audit, there is positive and significant relation.

Beside, Alzeban (2018) pointed that if they find procedures of monitoring absence, there is weakness in internal control activity.

Huy, D.T.N et al (2020) stated macro factors can affect stock price of listed banks.

Methodology and Data

Method and Data

This study mainly use combination of quantitative methods and qualitative methods including synthesis, inductive and explanatory methods.

We also use experience on internal control and risk management and experts’ opinions.

For quantitative analysis, the study is supported with OLS regression. Data is collected from reliable internet sources and websites.

$$Y(\text{MUFJ stock price}) = f(x_1, x_2, x_3, x_4, x_5, x_6) = ax_1 + bx_2 + cx_3 + dx_4 + ex_5 + fx_6 + k$$

Explain: x1: GDP growth rate (g), x2: inflation, x3: net sale, x4: lending rate, x5: cost (c.o), x6: S & P500

Main Results

General Data Analysis

Below charts show us that: between cost, net sale and Y- stock price: there is negative correlation while positive correlation shown in CPI Japan and Y:

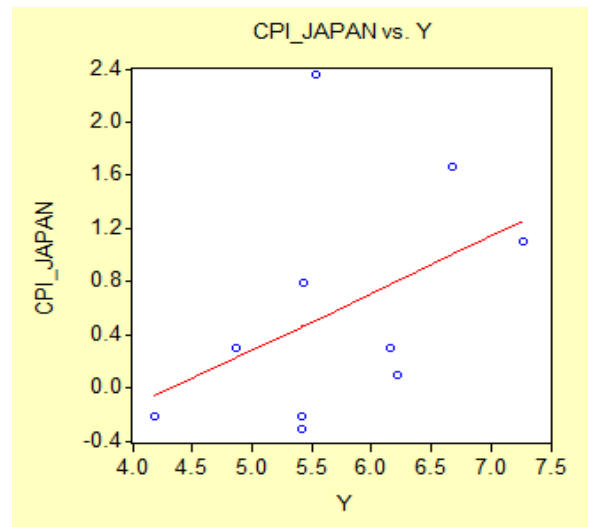


Chart 2. MUFJ stock price (Y) vs. Inflation (CPI)

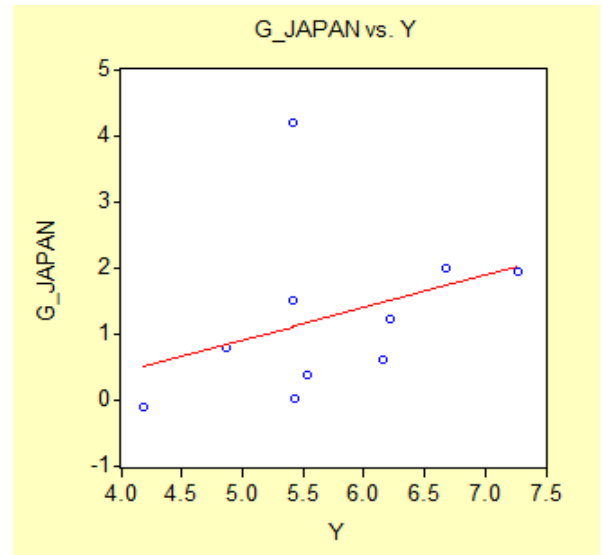


Chart 3. Y vs. GDP Growth

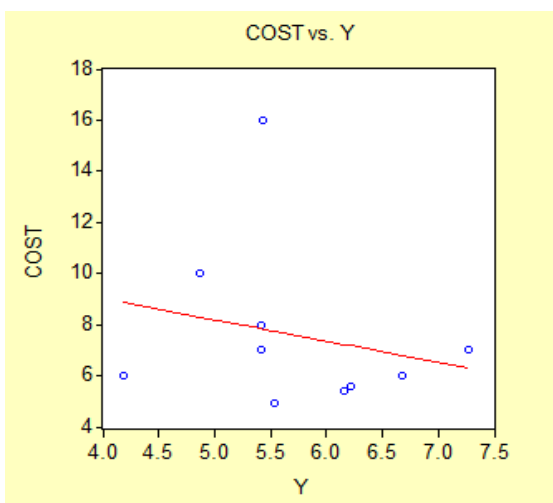


Chart 1. MUFJ Stock price (Y) vs. Cost (C)

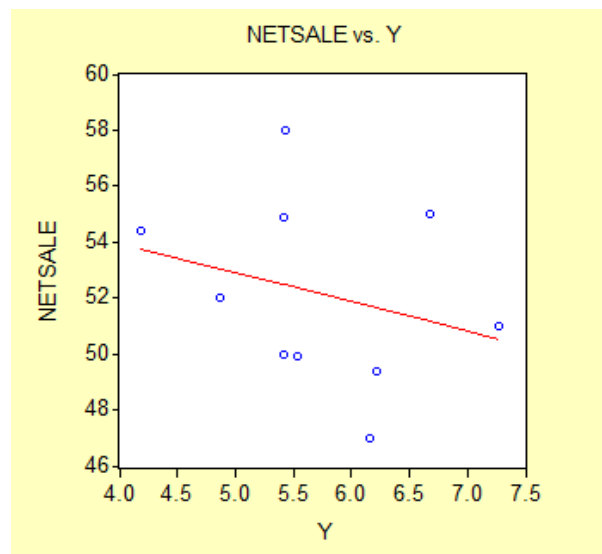


Chart 4. Y vs. Sale

- Correlation of cost and Y is higher than that of GDP and Y (figure 2).

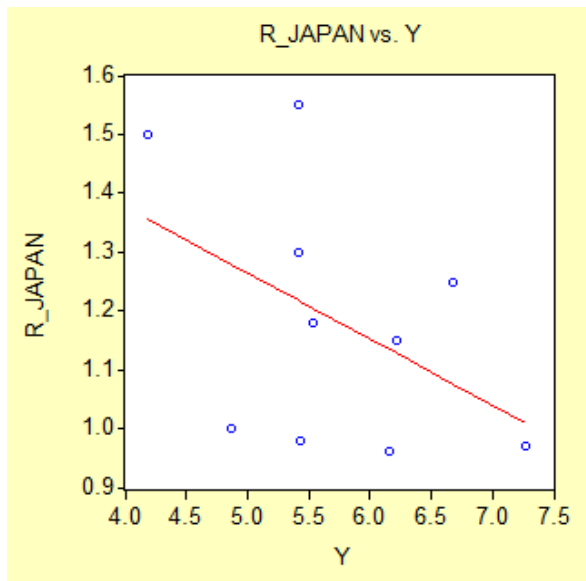


Chart 5. Y vs. Lending Rate

Below tables show us that:

- Standard deviation of inflation is lowest value and negative (table 1)

Table 1. Statistics for macro and micro economic factors

Unit: %

	Net profit	Net sales	Cost	MUFJ stock price	Inflation Japan	Lending rate Japan	GDP growth - US	Inflation US (CPI)	S & P500
Mean	52.16	8.30	7.59	5.72	0.59	1.18	2.24	1.76	2354.99
Median	51.5	8.55	6.5	5.48	0.3	1.165	2.23	1.825	2331.12
Maximum	58	11	16	7.27	2.36	1.55	2.92	2.96	2752.06
Minimum	47	4.8	4.9	4.19	-0.31	0.96	1.55	0.73	2043.94
Standard dev.	3.335	2.333	3.307	0.891	0.888	0.217	0.485	0.680	294.931

Table 2. Correlation matrix for seven (7) micro and macro-economic variables (GDP growth, inflation in VN, market interest rate, Risk free rate, exchange rate and MBB stock price)

obs	Y	R_JAPAN	SP500	COST	CPI_JAPAN	G_JAPAN	NETPROFIT	NETSALE
1	5.410000	1.550000	1286.120	7.000000	-0.310000	4.192000	4.800000	54.90000
2	4.190000	1.500000	1312.410	6.000000	-0.210000	-0.115000	5.500000	54.40000
3	5.420000	1.300000	1426.190	8.000000	-0.210000	1.495000	5.300000	50.00000
4	6.680000	1.250000	1782.590	6.000000	1.670000	2.000000	11.00000	55.00000
5	5.530000	1.180000	2058.900	4.900000	2.360000	0.375000	11.00000	49.90000
6	6.220000	1.150000	2043.940	5.600000	0.100000	1.223000	10.00000	49.40000
7	6.160000	0.960000	2238.830	5.400000	0.300000	0.609000	8.600000	47.00000
8	7.270000	0.970000	2673.610	7.000000	1.100000	1.929000	8.500000	51.00000
9	4.870000	1.000000	2506.850	10.00000	0.300000	0.788000	9.800000	52.00000
10	5.430000	0.980000	3230.780	16.00000	0.790000	0.009000	8.500000	58.00000

Below table shows an increase in inflation have positive effect on in MUFJ stock price.

Table 3. Covariance matrix for 7 macro economic variables

Covariance Matrix								
	Y	R_JAPAN	SP500	COST	CPI_JAPAN	G_JAPAN	NETPROFIT	NETSALE
Y	0.713736	-0.079932	161.0076	-0.588320	0.304988	0.349869	0.830700	-0.747880
R_JAPAN	-0.079932	0.042424	-110.3189	-0.223960	-0.062576	0.106422	-0.283100	0.199260
SP500	161.0076	-110.3189	361545.2	1203.090	187.3542	-297.5591	700.4785	196.4273
COST	-0.588320	-0.223960	1203.090	9.844900	-0.271110	-0.879705	-0.513000	6.170600
CPI_JAPAN	0.304988	-0.062576	187.3542	-0.271110	0.709769	-0.205936	1.427200	0.000860
G_JAPAN	0.349869	0.106422	-297.5591	-0.879705	-0.205936	1.453291	-0.859110	0.400270
NETPROFIT	0.830700	-0.283100	700.4785	-0.513000	1.427200	-0.859110	4.898000	-1.336000
NETSALE	-0.747880	0.199260	196.4273	6.170600	0.000860	0.400270	-1.336000	10.00840

Regression Model and Main Findings

1. Scenario 1: Regression model with Single Variable

We see that:

- As coefficient -0.05, cost and Y has negative correlation.

Using Eview gives us the below results:

2. Scenario 2 - Regression Model with 2 Variables

Running Eview gives us below results:

Dependent Variable: Y
 Method: Least Squares
 Date: 03/02/20 Time: 22:41
 Sample: 1 10
 Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
COST	-0.059759	0.092822	-0.643803	0.5377
C	6.171570	0.762342	8.095535	0.0000
R-squared	0.049258	Mean dependent var	5.718000	
Adjusted R-squared	-0.069585	S.D. dependent var	0.890528	
S.E. of regression	0.920990	Akaike info criterion	2.850122	
Sum squared resid	6.785787	Schwarz criterion	2.910639	
Log likelihood	-12.25061	F-statistic	0.414482	
Durbin-Watson stat	2.064212	Prob(F-statistic)	0.537718	

Dependent Variable: Y
 Method: Least Squares
 Date: 03/02/20 Time: 22:42
 Sample: 1 10
 Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
COST	-0.048435	0.090609	-0.534554	0.6095
CPI_JAPAN	0.411200	0.337456	1.218530	0.2625
C	5.843427	0.787704	7.418299	0.0001
R-squared	0.215635	Mean dependent var	5.718000	
Adjusted R-squared	-0.008470	S.D. dependent var	0.890528	
S.E. of regression	0.894291	Akaike info criterion	2.857754	
Sum squared resid	5.598297	Schwarz criterion	2.948530	
Log likelihood	-11.28877	F-statistic	0.962207	
Durbin-Watson stat	2.404655	Prob(F-statistic)	0.427380	

We see that:

- As coefficient 0.41, CPI and Y has positive correlation.

3. Scenario 3 - Regression Model with 3 Variables

Eviews generates below statistical results:

Dependent Variable: Y
 Method: Least Squares
 Date: 03/02/20 Time: 22:42
 Sample: 1 10
 Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
COST	-0.018757	0.090020	-0.208364	0.8418
CPI_JAPAN	0.510062	0.332988	1.531776	0.1765
G_JAPAN	0.301666	0.238007	1.267469	0.2520
C	5.182705	0.918015	5.645554	0.0013
R-squared	0.381292	Mean dependent var	5.718000	
Adjusted R-squared	0.071937	S.D. dependent var	0.890528	
S.E. of regression	0.857899	Akaike info criterion	2.820514	
Sum squared resid	4.415944	Schwarz criterion	2.941548	
Log likelihood	-10.10257	F-statistic	1.232541	
Durbin-Watson stat	1.659152	Prob(F-statistic)	0.377062	

We see that:

- As coefficient 0.3, GDP Japan and Y has positive correlation.

4. Scenario 4 - Regression Model with 4 Macro and Micro Variables

Eviews presents the below results:

Dependent Variable: Y
 Method: Least Squares
 Date: 03/02/20 Time: 22:43
 Sample: 1 10
 Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
COST	0.081791	0.117129	0.698295	0.5161
CPI_JAPAN	0.580517	0.322517	1.799956	0.1318
G_JAPAN	0.411530	0.243155	1.692458	0.1513
NETSALE	-0.141661	0.112226	-1.262288	0.2625
C	11.62971	5.181929	2.244281	0.0748
R-squared	0.530810	Mean dependent var	5.718000	
Adjusted R-squared	0.155458	S.D. dependent var	0.890528	
S.E. of regression	0.818386	Akaike info criterion	2.743887	
Sum squared resid	3.348776	Schwarz criterion	2.895180	
Log likelihood	-8.719435	F-statistic	1.414167	
Durbin-Watson stat	2.789935	Prob(F-statistic)	0.350891	

We see that:

- As coefficient -0.14, net sale and Y has negative correlation.

5. Scenario 5 - Regression Model with 6 Macro and Micro Variables

Running Eviews gives us results:

Dependent Variable: Y
 Method: Least Squares
 Date: 03/02/20 Time: 22:43
 Sample: 1 10
 Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
COST	-0.175940	0.155862	-1.128821	0.3221
CPI_JAPAN	0.118025	0.338848	0.348311	0.7452
G_JAPAN	0.430047	0.190358	2.259150	0.0868
NETSALE	0.099897	0.147214	0.678583	0.5346
R_JAPAN	-4.186826	2.048648	-2.043702	0.1105
C	6.192686	4.847436	1.277518	0.2705
R-squared	0.770475	Mean dependent var	5.718000	
Adjusted R-squared	0.483569	S.D. dependent var	0.890528	
S.E. of regression	0.639961	Akaike info criterion	2.228890	
Sum squared resid	1.638200	Schwarz criterion	2.410441	
Log likelihood	-5.144451	F-statistic	2.685464	
Durbin-Watson stat	2.692266	Prob(F-statistic)	0.179933	

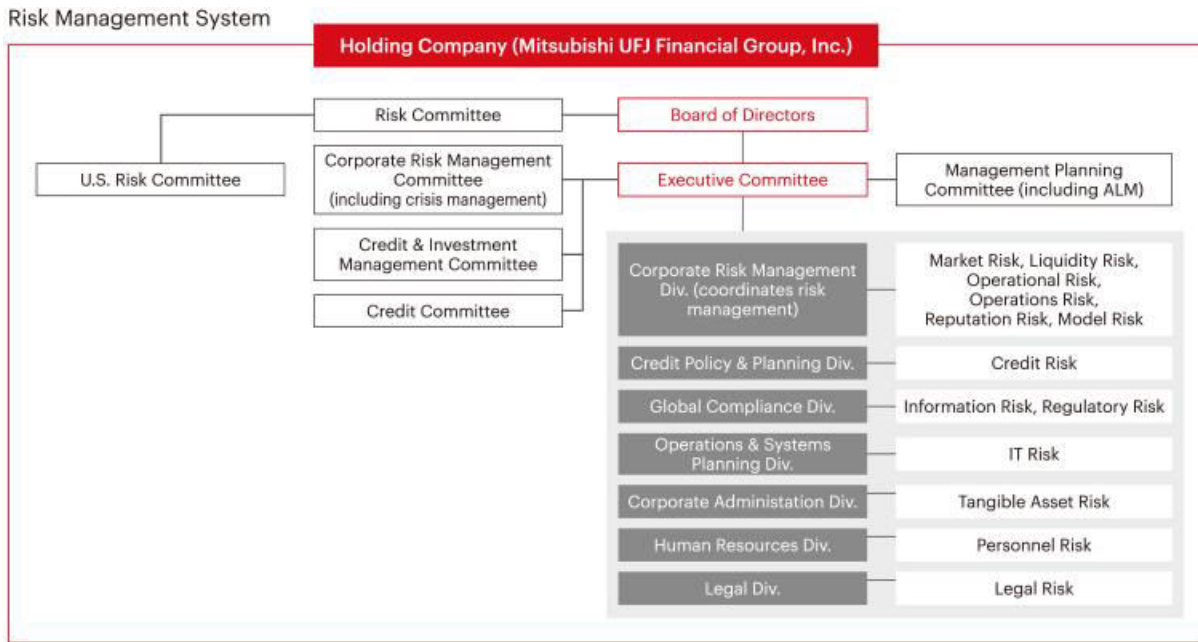
We see that:

- As coefficient -4.1, R japan and Y has negative correlation.

Risk happens and makes MUFJ stock price declines if GDP growth declines, lending rate increases (highest coefficient), then cost increases and low inflation.

Discussion and Further Researches

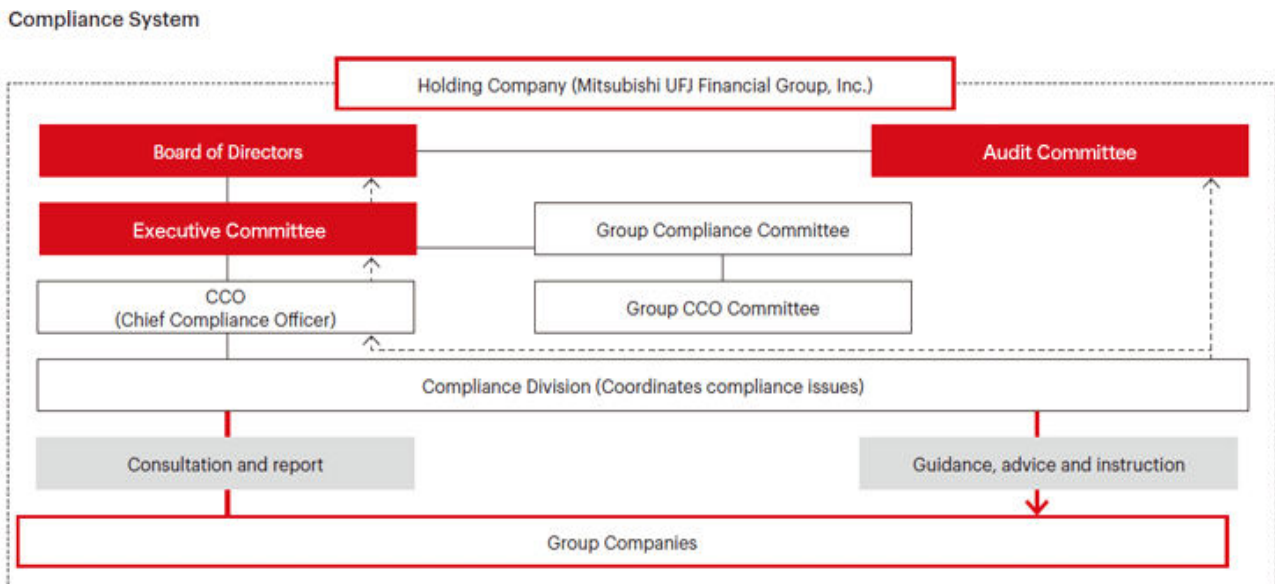
After the global crisis 2008, MUFJ has developed RM system as below:



(Source: MUFJ reports)

Compliance management divisions have been established at the holding company Mitsubishi UFJ Financial Group, and at MUFG Bank, Mitsubishi UFJ Trust and Banking, and Mitsubishi UFJ Securities Holdings (referred to as the three companies below). Each compliance

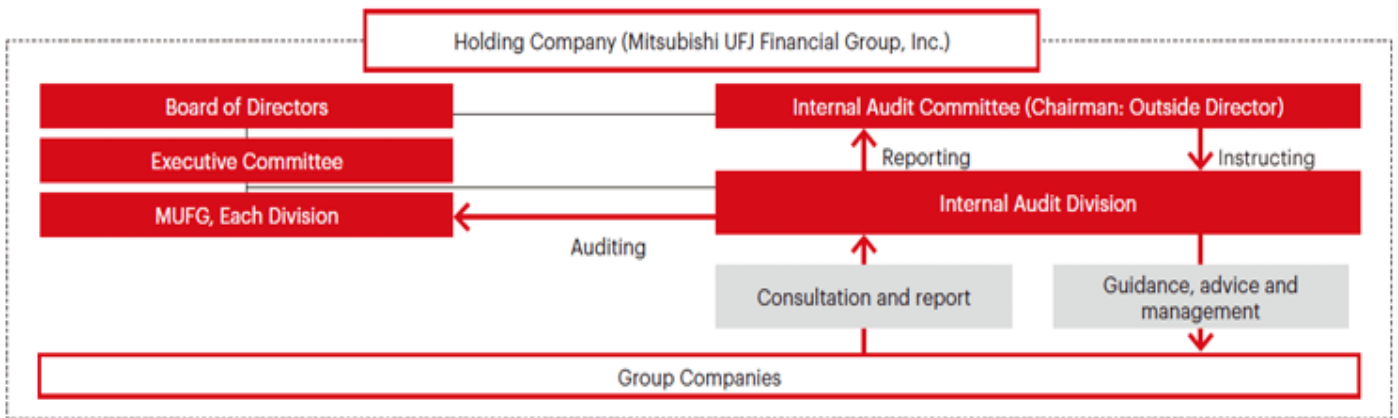
management division formulates compliance programs and organizes training courses to promote compliance, and regularly reports to each company's board of directors and Executive Committee on the status of compliance activities. And its compliance system:



(Source: MUFJ reports)

And then an internal audit framework:

Internal Audit Framework



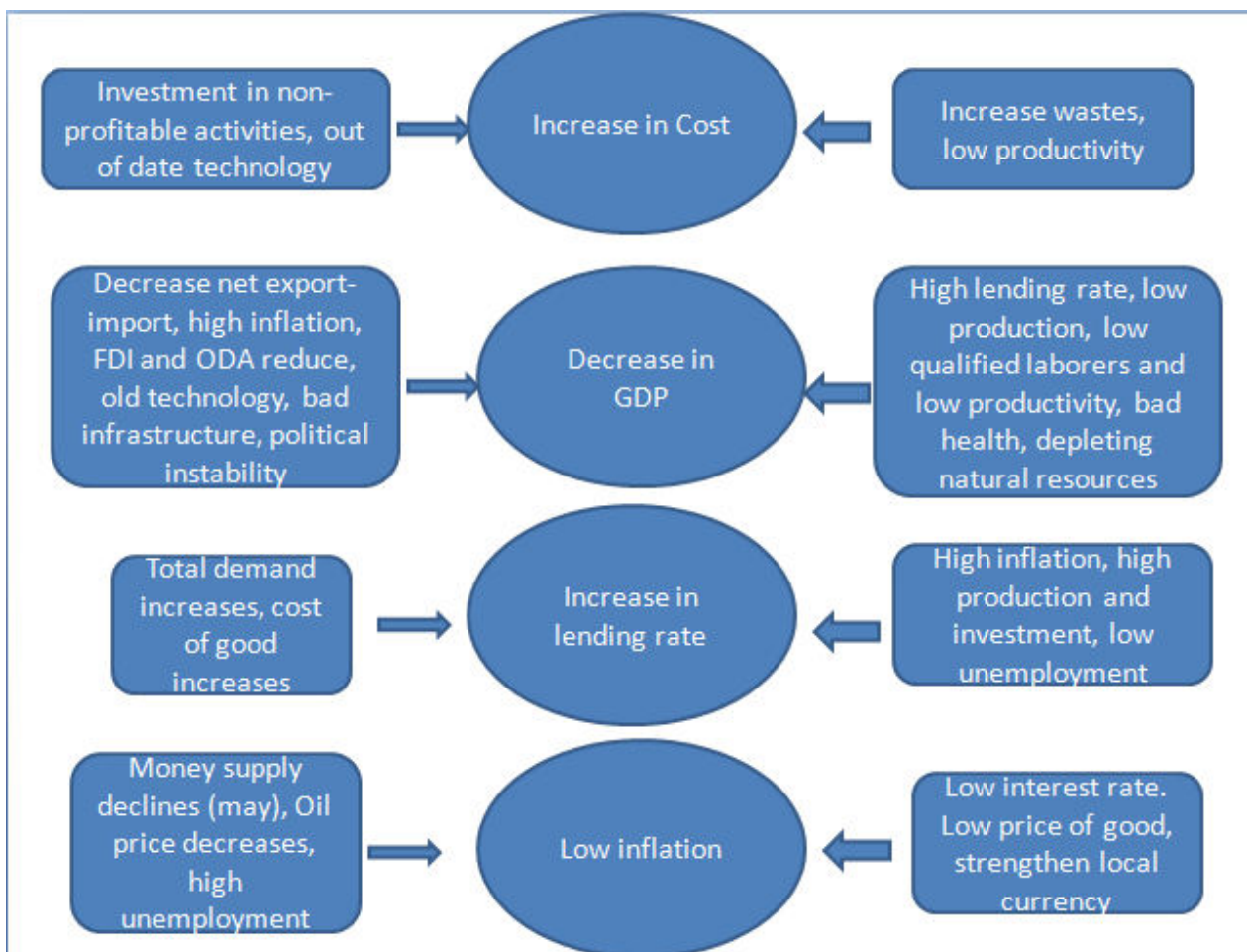
(Source: MUFJ reports)

In addition, Above analysis Y declines when GDP growth declines.

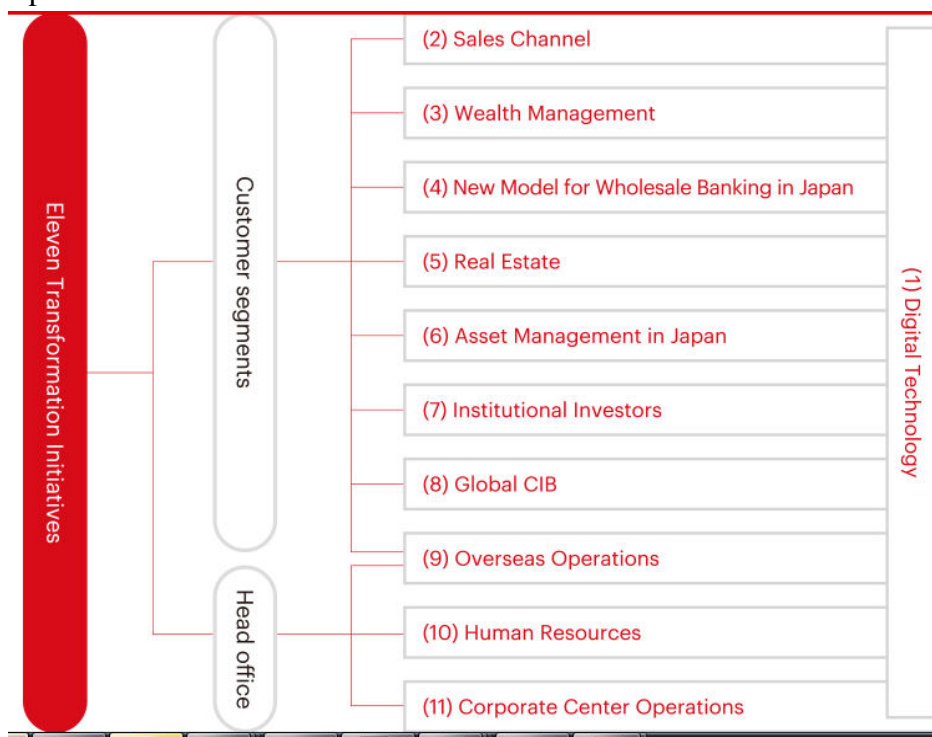
Therefore, the below figure will show us most of factors' impacts on the above micro and macro

factors that create risk for stock price declines of MUFJ:

Figure – Risk of MUFJ stock price decline

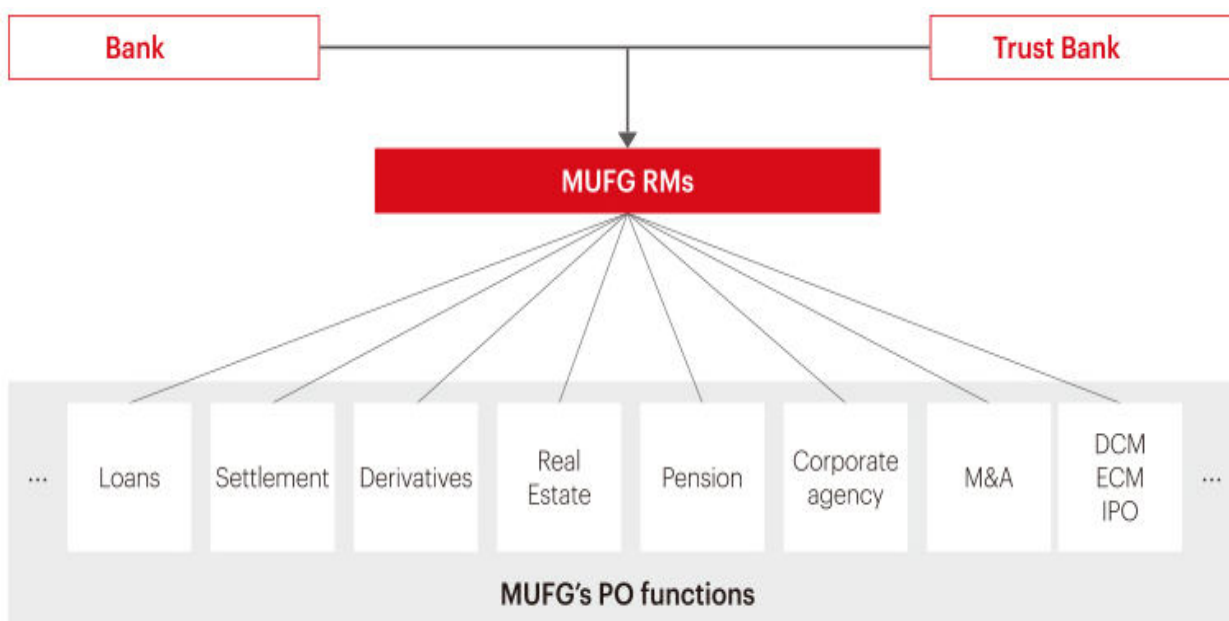


The medium strategy of MUFJ as follows: (which filed) need to be controlled rationally: will connect and implies business risks in each



(Source: MUFJ reports)

Next, restructuring wholesale banking in MUFJ also implies potential risks in each filed and need to be managed:



(Source: MUFJ annual reports)

Conclusion and Policy Suggestion

Policy implications:

- Inflation or CPI need to be controlled better.
- Lending rate policy controlled for risk prevention.
- GDP growth positive good for stock price.

Limitation of Research

We need to expand research models for other markets.

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References

- [1] Ahmad, N., & Ramzan, M. (2016). Stock Market Volatility and Macroeconomic Factor Volatility. *International Journal of Research in Business Studies and Management*, 3(7), 37-44.
- [2] Arshad, Z., Ali, R.A., Yousaf, S., & Jamil, S. (2015). Determinants of Share Prices of listed Commercial Banks in Pakistan. *IOSR Journal of Economics and Finance*, 6(2), 56-64.
- [3] Ayub, A., & Masih, M. (2013). *Interest Rate, Exchange Rate, and Stock Prices of Islamic Banks: A Panel Data Analysis*, MPRA Paper No. 58871.
- [4] Cherif, R., & Hasanov, F. (2012). *Public Debt Dynamics: The Effects of Austerity, Inflation, and Growth Shocks*, IMF Working paper WP/12/230.
- [5] Huy, D.T.N., Thach, N.N., Chuyen, B.M., Nhung, P.T.H., Tran, D.T., & Tran, T.A. (2021). Enhancing risk management culture for sustainable growth of Asia commercial bank-ACB in Vietnam under mixed effects of macro factors.

Entrepreneurship and Sustainability Issues, 8(3), 291-207.

https://econpapers.repec.org/article/ssijouesi/v_3a8_3ay_3a2021_3ai_3a3_3ap_3a291-307.htm

- [6] Hang, T.T.B., Nhung, D.T.H., Huy, D.T.N., Hung, N.M., & Pham, M.D. (2020). Where Beta is going—case of Viet Nam hotel, airlines and tourism company groups after the low inflation period. *Entrepreneurship and Sustainability Issues*, 7(3), 2282-2298.
<https://ideas.repec.org/a/ssi/jouesi/v7y2020i3p2282-2298.html>
- [7] Dang, N.H., Hoang, T.V.H., & Tran, M.D. (2017). Factors affecting earnings management: The case of listed firms in Vietnam. *International Journal of Economic Research*, 14(20), 117-134.
<http://www.serialsjournal.com>
- [8] Huy, D.T.N., Loan, B.T.T., & Pham, T.A. (2020). Impact of selected factors on stock price: a case study of Vietcombank in Vietnam. *Entrepreneurship and Sustainability Issues*, 7(4), 2715-2730.
<https://ideas.repec.org/a/ssi/jouesi/v7y2020i4p2715-2730.html>
- [9] Huy, D.T.N. (2015). The critical analysis of limited south asian corporate governance standards after financial crisis. *International Journal for Quality Research*, 15(1), 741-746.
<http://www.ijqr.net/paper.php?id=378>
- [10] Huy, D.T.N., Dat, P.M., & Anh, P.T. (2020). Building and econometric model of selected factors' impact on stock price: a case study. *Journal of Security and Sustainability issues*, 9(M), 77-93.
https://cibg.org.au/index.php/cibg/article/viewFile/9/journal/article_8416.html
- [11] Huy, D.T.N., & Hien, D.T.N. (2010). The backbone of European corporate

- governance standards after financial crisis, corporate scandals and manipulation. *Economic and Business Review*, 12(4), 215-240.
<http://ojs.ebrjournal.net/ojs/index.php/ebr/article/download/101/30>
- [12] Krishna, R.C. (2015). Macroeconomic Variables impact on Stock Prices in a BRIC Stock Markets: An Empirical Analysis. *Journal of Stock & Forex Trading*, 4(2), 1-7.
- [13] Kulathunga, K. (2015). Macroeconomic Factors and Stock Market Development: With Special Reference to Colombo Stock Exchange. *International Journal of Scientific and Research Publications*, 5(8), 1-7.
- [14] Ihsan, H., Ahmad, E., Muhamad, I.H., & Sadia, H. (2015). *International Journal of Scientific and Research Publications*, 5(8).
- [15] Jarrah, M., & Salim, N. (2016). The Impact of Macroeconomic Factors on Saudi Stock Market (Tadawul) Prices. *Int'l Conf. on Advances in Big Data Analytics*.
- [16] Luthra, M., & Mahajan, S. (2014). Impact of Macro factors on BSE Bankex. *International Journal of Current Research and Academic Review*, 2(2), 179-186.
- [17] Ndlovu, M., Faisal, F., Nil, G.R., & Tursoy, T. (2018). The Impact of Macroeconomic Variables on Stock Returns: A Case of the Johannesburg Stock Exchange. *Romanian Statistical Review*, 2, 88-104.
- [18] Pan, Q., & Pan, M. (2014). The Impact of Macro Factors on the Profitability of China's Commercial Banks in the Decade after WTO Accession. *Open Journal of Social Sciences*, 2, 64-69.
- [19] Quy, V.T., & Loi, D.T.N. (2016). Macroeconomic factors and Stock Price – A Case of Real Estate Stocks on Ho Chi Minh Stock Exchange. *Journal of Science Ho Chi Minh City Open University*, 2(18), 63-75.
- [20] Saeed, S., & Akhter, N. (2012). Impact of Macroeconomic Factors on Banking Index in Pakistan. *Interdisciplinary Journal of Contemporary Research in Business*, 4(6), 1200-1218.
- [21] <https://www.sbv.gov.vn>
- [22] <https://nif.mof.gov.vn>