AN EMPIRICAL RESEARCH OF THE RELATIONSHIP BETWEEN PUBLIC DEBT AND ECONOMIC GROWTH IN VIETNAM

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ABSTRACT

The paper uses the Vector Auto Regression (VAR) model and Granger Causality Analysis to analyze the two-way relationship between public debt and economic growth in Vietnam between 1992 and 2016. Pulse response functions, variance decomposition, ADF unit tests, residual autocorrelation assays and co-alignment tests were performed to examine the transmission mechanism of shocks, fluctuations of variables and the suitability of the model. The results show that there is a one-way causal relationship between public debt and economic growth in Vietnam. This is the basis for the writer to propose policy suggestions on public debt and economic development in Vietnam.

KeyWords: Public Debt, Economic Growth, VAR Model, Granger Causality Analysis

1. INTRODUCTION

The relationship between public debt and other macroeconomic variables has been studied for a long time in the world. The first is Keynesian (1936). Keynes argues that government borrows money to cover the budget deficit as the government wants to cut taxes and keep public spending unchanged. This affects consumer behavior of the people. Consumption increased as aggregate demand for goods and services increased, so output and employment increased in the short term. In the long run, debt financing leaves the debt burdens for future generations and many other implications. Contrary to Keynes's view, Ricardo (1970) argues that the tax cuts offset by government debt will not affect consumption as Keynes views, even in the short run. On the contrary, it increases private savings as people prepare for higher taxes in the future because they think the government will levy higher taxes to pay principal and interest on current liabilities.

Increasing interest rates have increased investment costs and reduced investment demand, leading to a reduction in private investment (Bui Dai Dung, 2012). This assumption considers that borrowing, especially domestic government debt, has a negative impact on economic growth. These views do not adequately account for the long-term effects of public debt on economic growth until the emergence of debt overhang (Krugman, 1988). This theory laid an important foundation for debt threshold studies. The argument of the "debt overhang" theory can be viewed in the debt Laffer curve.

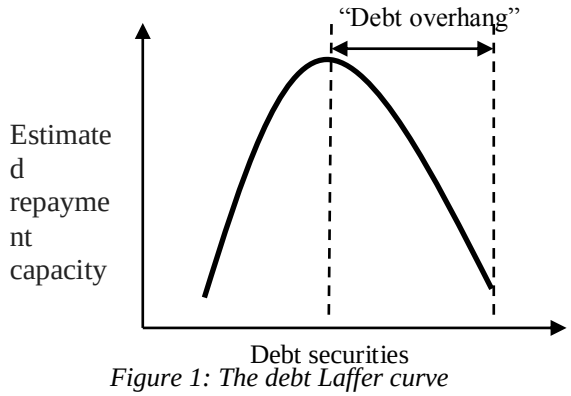


Figure 1: The debt Laffer curve

The development of the theory does not stop here as economists try to find a more concrete explanation for the relationship between public debt and economic growth in the long run and short term. Elmendorf and Mankiw (1999) inherited Keynes's view that short-term fiscal deficits (or greater public debt) have a positive effect on total income, aggregate demand and output, and this will become different in the long run. The study estimates that every dollar of government borrowing adds to a steady decline in output of about 10 cents. But this study uses only American data samples that estimate for the whole as a whole, so it's not quite convincing. In short, early theories suggest that public debt often has a negative impact on growth, but this effect may be small. More complex models have resulted in the relationship between public debt and growth. But in general, the relationship between public debt and growth depends on many other macroeconomic cyclical and structural factors.The objective of the study is to investigate the relationship between public debt and economic growth.

Hence, the study will determine the optimal public debt ratio to maximize economic growth. As a result, the study hopes to contribute to policy of public debt management such as effective mobilizing and using public debt for development in Vietnam.

2. LITERATURE REVIEW

For time series data, considering stopping is a first step and helps in choosing the right model and avoiding false regression. The author looks at the dataset before selecting the model and finds that public debt and GDP growth are two stops, with such a dataset being able to apply the VAR model. The author compares the VAR model with the VECM model, and if the VECM model is to be used, then the data series must be non-stop and co-integrated, so choose the model. VAR is suitable. In addition, the paper uses the Granger test to determine the direction and magnitude of the impact of public debt and economic growth. To examine the impact of shocks between variables and the impact of shocks on predictive error variance of future variables to provide a control solution, the use of the VAR model is appropriate because it is possible Provides tools such as pulse response and decomposition function.

The VAR model was proposed by US economic scientist Christopher A. Sims in 1980. In essence, the VAR model is a combination of the univariate auto regression model (AR model) Simultaneous Equations (Ses). The combined VAR model with the advantage of the two methods is easy to estimate by means of least squares (OLS), estimating multiple variables in the same system. And in particular, the VAR model considers exogenous

variables and endogenous variables on the same basis and there is no empirical distinction. Thus, for this study, two variables PUB and GDP are considered endogenous variables in the VAR model. These are the reasons that the VAR model has become so prevalent in macroeconomic research for measuring dependence and linear correlation between multiple variables over time series and also the reason the author selects the model.

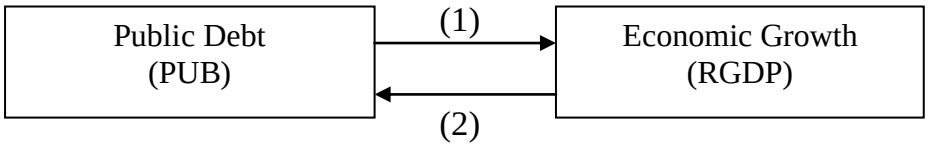


Figure 2: VAR model analysis framework

3. RESEARCH METHODOLOGY

Econometric Models: Includes VAR model and model stability tests.

The VAR model: The interaction model between the two GDP and PUB variables is proposed as follows (Tajudeen Egbetunde, 2012):

GDP = f (PUB) (1.1)

Of which GDP is gross domestic product, PUB is public debt comparable to GDP.

Then, the model (1.1) was written as a VAR model (Tajudeen Egbetunde, 2012) as follows:

$$GDP_t = a_{10} + \sum_{j=1}^{k} a_{ij}\, GDP_{t-j} + \sum_{j=1}^{k} b_{ij}\, PUB_{t-j} + u_{1t} \qquad (1.2)$$

$$PUB_t = a_{20} + \sum_{j=1}^{k} a_{2j}\, PUB_{t-j} + \sum_{j=1}^{k} b_{2j}\, GDP_{t-j} + u_{2t} \qquad (1.3)$$

Where: RGDPt represents economic growth
PUBt represents public debt
Ut is the error due to white noise

Here, assume that both GDPt and PUBt are stop sequences and u1t and u2t are also stop sequences and not self-correlated.

3.1 Data

The study uses secondary data (time series data) as the macroeconomic indicators of Vietnam such as gross domestic product, public debt, investment, money supply, openness Economy, interest rates, human capital, and population growth between 1992 and 2016. The data collected is collected through press releases on the socio-economic status of the population. General Statistics Office of Vietnam, Asian Development Bank (ADB) Online Resources, International Monetary Fund (IMF) and World Bank.

3.2 VAR Modeling Techniques:

3.4 Stop counting is the first step in estimating a model. One of the first assumptions of the VAR model is that the data strings must stop. In this study, the author uses an ADF unit test to verify the pause for the GDP and PUB data series, implemented using the Eviews 6.0 software.

3.5 The optimal latency determination based on selection criteria (Ozcicek & McMillin, 1999) is supported in Eviews software such as Akaike (AIC), Schwarz

(SC) Hannan-Quinn (HQ). Minimum latency of indicators will be selected. Which latencies have more and fewer targets will be selected.

3.6 Granger's causality test was conducted to study the one-way dimension of the GDP effect on the PUB variable, making PUB one-way effect on GDP, or both variables interacting with one another. The use of causal checks for the two series of GDPt and PUBt stops in the VAR model (Tajudeen Egbetunde, 2012) is as follows:

$$\mathrm{GDP_t} = a_1 + \sum_{i=1}^{r} \alpha_i \, GDP_{t-i} + \sum_{j=1}^{s} \beta_j \, PUB_{t-j} + \varepsilon_{1t} \qquad (1.4)$$

$$\mathrm{PUB_t} = a_2 + \sum_{i=1}^{p} \theta_i \, PUB_{t-i} + \sum_{j=1}^{q} \delta_j \, GDP_{t-j} + \varepsilon_{2t} \qquad (1.5)$$

Assume that ε_1t and ε_2t are stop sequences and not self-correlated.
Specifically, the Granger test has the following hypothesis pairs:

{ H0: GDP does not cause PUB
H1: GDP causes PUB

3.3 Verify the stability of the VAR Model by various tests. These tests help to check whether the model under study is appropriate and if so, the errors of the model will be overcome.

4. RESULTS AND DISCUSSION

4.1 Test stop counting

The results of stop counting are shown in the following table:

Table 4.1: ADF stop counting results

Variable	ADF level 0		ADF level 1	
	Blocking	Blocking and trending	Blocking	Blocking and trending
GDP	-6,225511*	-7,300183*	-3,910442*	-3,631327***
PUB	-13,26836*	-8,620863*	-2.855958***	-2,746512

The results of unit tests in the ADF with non-trending and non-trending coefficients show that the variables are in the same order, PUB and GDP with zero integration at all three levels of meaning, and these two variables also integrate level 1 in Meaning level of 10%. For unit tests in the ADF with blocking coefficients and trends, these two variables together stop at level 0 with 3 levels of significance.

PUB and GDP are two stopping sequences, with zero integration at the 1%, 5% and 10% significance level, ensuring that data must be stopped at the same level in the VAR model estimation. To be sure between the variables are co-link. After the stop counting, proceed to estimate the VAR model with two variables PUB and GDP.

Table 4.2: Optimal latency selection results

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-156,4758	NA	26160,23	15,84758	15,94716	15,86702

1	-134,7991	36,85047*	485,994*	14,0799*	14,3786*	14,1382*
2	-132,6071	3,287982	5467,661	14,26071	14,75858	14,35790
3	-130,9307	2,179300	7180,265	14,49307	15,19008	14,62913
4	-129,6152	1,447003	10143,33	14,76152	15,65768	14,93646
5	-121,9448	6,903446	8040,499	14,39448	15,48978	14,60829
* indicates lag order selected by the criterion. LR: sequential modified LR test statistic (each test at 5% level), FPE: Final prediction error. AIC: Akaike information criterion. SC: Schwarz information criterion. HQ: Hannan-Quinn information criterion.						

The results from Table 4.2 show that the appropriate latency is 1, since this latency corresponds to the LR, FPE, AIC, SC and HQ standards. Meaning level is 5%.

Then, re-estimate the VAR model with the two PUB and GDP variables with the selected delay.

Table 4.3: Granger test results

Pairwise Granger Causality Tests, Lags: 1			
Null Hypothesis:	Obs	F-Statistic	Prob.
GDP does not Granger Cause PUB	24	0,03210	0,8595
PUB does not Granger Cause GDP	24	6,57280	0,0181

Granger verification for the two-variable VAR model and GDP, lag time of 1. The results show that the probability of hypothesis H0 (GDP does not cause PUB) is 0.8595. This probability is greater than the 5% significance level, so H0 cannot be rejected. Thus, there is no one-way

causal relationship from GDP to PUB. The probability of hypothesis H0 (PUB does not cause GDP) is 0.0181. This probability is less than 5%, rejecting H0. Thus, there is a one-way causal relationship from PUB to GDP. In sum, the Granger causality test shows that public debt is one-way causal to economic growth but not one-way causal from economic growth to public debt.

4.2 Estimated results of the VAR model

The regression result of the VAR model shows that the coefficient of PUB (-1) is statistically significant at 10%. The delay of the PUB variable affects itself and the PUB delay also affects the GDP. It means that the public debt of the year (t-1) will affect public debt of year t, and affect the annual growth of t. specifically, when public debt rose to 1% last year, that would affect 70.1067% to public debt this year and contribute to GDP this year increased by 3.5726%. As the public debt rises, growth is also rising, showing the same relationship between public debt and economic growth. In addition, GDP (-1) also has an impact on GDP, particularly when GDP increased by 1% last year, contributing to 45.2880% GDP growth this year.

Table 4.4: Results of the VAR model estimation

	PUB	GDP
PUB(-1)	0,701067*	0,035726*
	(0,02315)	(0,01394)
	[30,2806]	[2,56375]
GDP(-1)	-0,047677	0,452880*
	(0,26610)	(0,16016)
	[-0,17917]	[2,82766]
C	14,86369*	4,877581
	(5,06805)	(3.05043)
	[2,93282]	[1,59898]
R-squared	0,977745	0,431024
Adj. R-squared	0,975626	0,376836
Sum sq. resids	2837,231	1027,860
S.E. equation	11,62352	6,996121
F-statistic	461,3129	7,954217
Log likelihood	-91,32488	-79,14069
Akaike AIC	7,860407	6,845058
Schwarz SC	8,007664	6,992314
Mean dependent	85,46000	15,34251
S.D. dependent	74,45154	8,862500
Determinant resid covariance (dof adj.)		6215,650
Determinant resid covariance		4758,857
Log likelihood		-169,7222
Akaike information criterion		14,64352
Schwarz criterion		14,93803

4.3 Validation of model conformity

Verify the AR root test

Figure 4.1 shows that the solutions of the model are less than 1 and are in unit circle, so the VAR model is considered stable and acceptable.

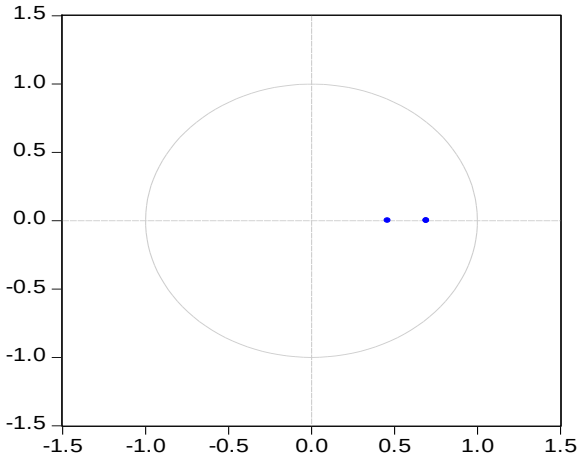


Figure 4.1 Verification of AR root test model VAR

4.4 Verification of co-linkage

Verification of co-linkage using Johansen and Juselius (1990). This test is to test the fake regression of the model estimated (because the initial correlation between GDP and PUB is very low) with the hypothesis:
H0: No cointegration between variables
H1: There are cointegration between variables

The test results in Table 4.5 with the hypothesis H0 show that Trace Statistic (24.96370) is significantly higher than the critical value (15.49471) at 5% significance level, wherever rejecting the null hypothesis. That means there are co-linkages between PUB variables and GDP. Max-Eigen Statistic (17.84978) is significantly higher than critical value (14. 2646) at 5% significance level. Therefore, the regression results are considered valid.

Table 4.5: Results of the co-test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0,555744	24,96370	15,49471	0,0014
At most 1 *	0,276287	7,113923	3,841466	0,0076
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0,555744	17,84978	14,26460	0,0130
At most 1 *	0,276287	7,113923	3,841466	0,0076

4.5 Variance decomposition reaction

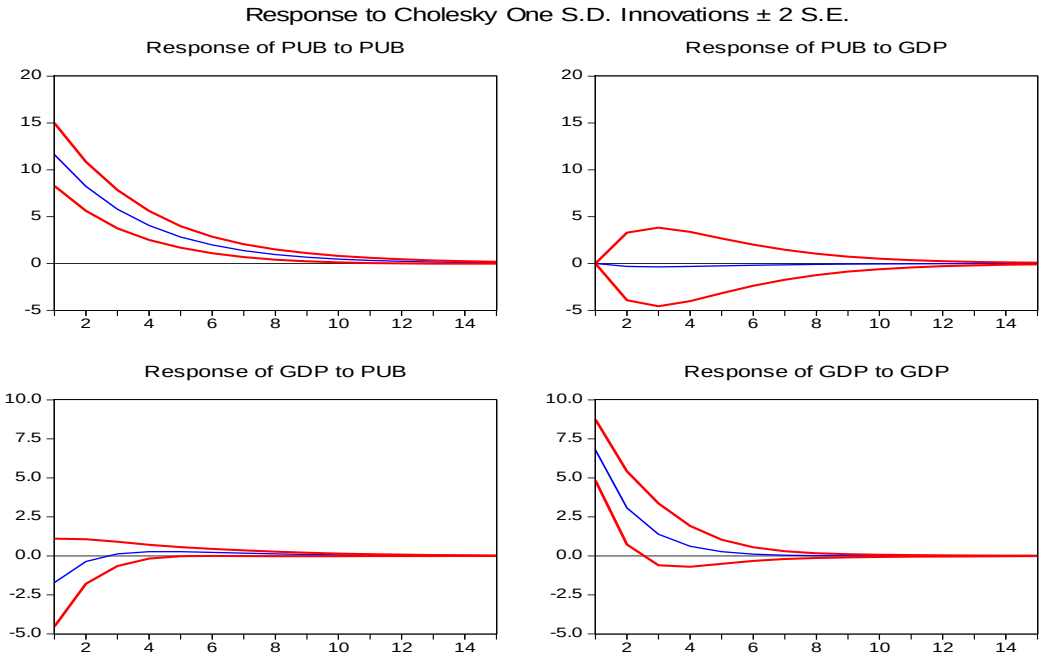
Table 4.6: Results of the variance distribution of PUB

Period	S.E.	PUB	GDP
1	11,62352	100,0000	0,000000
2	14,24618	99,94847	0,051527
3	15,38140	99,89694	0,103061
4	15,90932	99,86132	0,138682
5	16,16069	99,83998	0,160022
6	16,28142	99,82815	0,171854
7	16,33960	99,82189	0,178110
8	16,36765	99,81868	0,181316
9	16,38118	99,81707	0,182927
10	16,38770	99,81628	0,183724

The results show that when public debt changes, economic growth and public debt explain how much percentage and vice versa. For PUB's variation decomposition, in the first year, economic growth shocks do not explain the volatility of public debt. In year 2, the economic growth shock explained 0.051527% of the public debt and its shock of 99.94847%. At year 10, the economic growth shock explained 0.183724% of the public debt and its shock of 99.81628%. Thus, in the first year of economic growth shock did not affect public debt but began to affect the second year and this effect has been increasing over time, but with little effect.

4.6 Pulse Response

Figure 4 shows the transmission mechanism of shocks. The image at the top right reflects the change in PUB before the change in GDP. PUB began to suffer a great deal after two years and gradually declined from the fourth year to the twelfth year without any impact. Starting in the second year, the red line is about 4 times the green line (this gap is greater than the distance of the lower left) showing that public debt fluctuates much before the change in GDP.



The figure on the left reflects the change in GDP before the change of PUB, which begins to affect after two years and gradually decreases until the seventh and eighth year. GDP began to rise and restored to its pre-shake position beginning in the second year, and PUB began to recover and resume its position as before the shocks started from the year 5th. The change in GDP before the change of PUB is less and less effect over the change of PUB before the change of GDP.

5. CONCLUSIONS

Firstly, Granger causality analysis can be used in the VAR model to study the causal relationship between public debt and economic growth in Vietnam. Secondly, results from the causal analysis of Granger show a one-way causal relationship between public debt and economic growth in Vietnam between 1992 and 2016. Thirdly, public debt has played a positive role in economic growth over the past 25 years in Vietnam. Estimates of the public debt VAR model and GDP growth in Vietnam for the period 1992-2016 show that public debt in the previous year increased by 1%, contributing to economic growth this year by 3.5726% and affecting 70.1067% of public debt this year. Public debt shock has the strongest impact on economic growth in the first year. Economic growth will recover as before a public debt shock from the second year and after about 7-8 years, economic growth is no longer affected by public debt shock.

On the limitations of the study are the characteristics of sample size or data

resource that impacted or influenced the interpretation of the findings from your research. Firstly, the data for the study were collected by year including 25 observations, which is not too large. Research samples with a small number of observations may affect the sample's representativeness over the whole. The suggestion for this restriction is to conduct research with data collected quarterly or monthly to increase the number of observations and thus increase the representative sample, if there are favorable conditions in data collection. Secondly, due to the limited access to data, some data of the variables in the study are estimated, the data of one variable collected and calculated from different sources leads to certain errors. The suggestion for this restriction is to try to collect data of variables from a given source and to estimate the possible errors in the model.

For the research future direction, further studies could broaden the assessment of Vietnam's public debt situation by assessing the number of countries the government borrows, the main currency types a study of the effects of domestic and foreign public debt on Vietnam's economic growth - domestic public debt or foreign public debt will have a more positive impact on economic growth. Study on the relationship between public debt, public investment and economic growth in Vietnam, study the crowding out effect of domestic public debt on private investment in Vietnam. Nam, study the effect of the interest rate and cost of government debt. In addition, further research may extend the scope and subject of research in emerging and developing economies in the Asian region

REFERENCES

Akaike, H. (1973), "Information theory and an extension of the maximum likelihood principle", Proc. 2nd Inter, Symposium on Information Theory, p.267-281, Budapest.

Barro, R.J. (1974), "Are Government Bonds Net Wealth?" Journal of Political Economy, 82 (6), p.1095-1117.

Bui, D. D. (2012), "Public Expenditure and Sustainable Development", Special Economic and Business Bulletin - VNU Journal of Science, Vol. 28, No. 4/2012, p.217.

Dickey, D.A. and Fuller, W.A. (1981), "Distribution of the estimators for autoregressive time series with a unit root", Econometrica 49, p.1057-72.

Egbetunde, T. (2012), "Public Debt and Economic Growth in Nigeria: Evidence from Granger Causality", American Journal of Economics 2012, 2 (6), p.101-106.

Elmendorf, D.W., and G.N. Mankiw (1999), "Government debt", In Handbook of Macroeconomics, Ed. By J.B. Taylor, and M. Woodford, vol.1 of Handbook of Macroeconomics, chap.25, p.1615-1669. Elsevier.

Johansen, S. and Juselius, K. (1990), "Maximum Likelihood Estimation and Inference on Cointegration", Oxford Bulletin of Economics and Statistics, 52, p.169-210.

Keynes, J. M. (1936), "The General Theory of Employment, Interest, and Money," Harcourt, Brace and World, CW. VII, p.128.

Krugman (1988), "Financing vs. forgiving a debt overhang ", Journal of Development

Economics, 1988, vol. 29, issue 3, p.253-268.

MacKinnon, J. G. (1996), "Numerical distribution functions for unit root and cointegration tests", Journal of Applied Econometrics, 11, p. 601-618.

Nguyen, H.T. (2012), "Foreign Debt Relations and Vietnam's Economic Growth," Journal of Development and Integration, No. 4 (14), May-June 2012, p.21-25.

Ozcicek, O. and McMillin, D.W. (1999), "Lag Length Selection in Vector Autoregressive Models: Symmetric and Asymmetric Lags", Applied Economics, 31, p.517-524.

Ricardo, D. (1970), "Funding System", An Fifth and Sixth Edition of the Encyclopedia Britannica, 1820, in The Works and Correspondence of David Ricardo, Vol. 4, Pamphlets and Paper 1815-1823, p.143-200.

Su, D. T. (2012), "Public Debt Relief - Empirical Research in Vietnam", Journal of Economic Development, No. 257, March 2012, p.20-26.

WB (2016), "World Development Indicat

THE ANALYSIS OF POTATO CHIPS PRODUCT DAMAGED RISK IN WIDURI JOINT VENTURE GROUP

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ABSTRACT

The purpose of this research is to identify the risks of potato chips product damaged, to measure and map the risk and formulating an effective risk mitigation strategy for Widuri joint venture group. This research uses qualitative approach. The method of risk management with Enterprise Risk Management (ERM). The location of the research is in Kijang City, Bintan, Kepulauan Riau. Data research obtained by interview, observation and documentation. The results showed that there are several factors that can cause the failure of the production process and the product itself which was an error in the selection of raw materials, passing the process of soaking potatoes, a mistake in the provision of lime paste, errors at uncontrolled fire, and neglect of human resources that have impact for entity. The impact of arising from risk was product destroyed, potatoes become scorched, and the potato chips would be easy to catch cold. The amount of risk experienced by Widuri joint venture group were reflected in the risk map formed on the measurement of risk based on probability and impact. Widuri joint venture group certainly have to develop a strategy for an effective risk mitigation were prioritized addressing the highest risk first to a lower risk so that the risk of product damaged can be minimized.

KeyWords: ERM, Product Damaged, Joint Venture

1. INTRODUCTION

Any activity that is performed whether it is by individuals or companies not in spite of the existence of such a risk. As an axample of operational risk as a work accident, mistake of human resources, the risk of product damaged, and many other risks. But any risk certainly have different impact and disadvantage between levels of one company with another company. This is a thing that should be noted and taken into account by any company or trade. In order for any losses and impact posed can be minimised. Risk is commonly associated with uncertainty, as the event may or may not occur (Fadun, 2013). Risk implies exposure to uncertainty or threat (Kannan and Thangavel, 2008); and 'a decision to do nothing explicitly avoids the opportunities that exist and leaving the threats unmanaged' (Hillson and Murray-Webster, 2007:26) (Fadun, 2013).

Each incident may cause and result in the occurrence of risk although in a very small percentage. Thus required an action or risk identification techniques and proper risk handling in accordance with the type of risk that occurs.

Businessmen must have good management in order to run the business so that the company can minimize that can occur. This means that the companies have estimate the risk of

anything that will be faced and arranged how to anticipate and who should run it.

The same thing can also occur on a joint venture group called Widuri joint venture group. A group of joint ventures that produce various kinds of processed potato chips that located in Kampung Kolam Renang at Kijang. Widuri joint venture group is established since 2000 that was formed and founded by Mrs. Sumiati along with member of the group of about 6 people who mostly are member of her family. Initially the establishment of objectives is to support family economy of the owners and members. This joint business group engaged in home industry.

As time went on, it became one of the centers of public attention in Bintan Regency. Especially in Kijang Kota Urban Village. Because the venue is often used as a place of the gift shop either by the local community as well as by tourists who are visiting Bintan Regency. In addition to gift shop products from Widuri Joint Venture Group, can also serve as a snack or a complementary dish on special events such as wedding receptions.

In conducting the activities of production, Widuri Joint Venture Group cannot be spared from risk of one of these the risk of product damaged. Such chips are destroyed, potatoes become scorched, and the potato chips would be easy to catch cold. Therefore the workers as well as the founder should pay attention to every detail of various aspects of its production to minimize the loss.

Product damaged is a condition in which the resulting product are incompatible with the standards to be achieved by the consumer and the company, of course.

This research was conducted with the following goals: 1) identify the risks of potato chips product failures, 2) to measure and map the risk, and 3) formulating an effective risk mitigation strategy for Widuri joint venture group.This research will be divided into 5 sections, where section 1 is for introduction, part 2 for literature review, part 3 for research methods, part 4 for results research and part 5 for conclusion research that has been funded.

2. LITERATURE REVIEW

For literature pertaining to this study, the authors use as the basis of the literature as a basis for understanding the use of modeling in research methodsthat will be in use. One of them performed by Fadun (2013), Ahmed, I., et, al. (2016), and Wiryani, H., et, al. (2013).Related research using the approach to ERM and support the research, such as Chitakornkijsil (2010) are researching about ERM. This study describe an overview of ERM at the organization in general, ranging from the definition of ERM, to the proces control and implementation of ERM (Wiryani, Achsani, & Baga, 2013).

2.1Risk: Definition, Types and Risk Management Process

According to Miller (1992), the term "risk" has conventionally been used to refer to any sort of unpredictability associated with the outcomes of an organisation (Luppino, Hosseini, & Rameezdeen, 2014).

Risk permeates firm's economic activities, because risk is the lifeblood of every organisation (Shimpi, 2001) in (Fadun, 2013). According to Skipper (1997) define risk has no universal definition; hence, variability of outcomes is a common way of expressing risk. Although definitions risk varies; risk has two dimensions or components: uncertainty and consequences (Fadun, 2013). Consequently, risk can be described in terms of its effect (positive or negative) on objective (Hillson and Murray-Webster, 2004; Damodaran, 2008;

Kannan and Thangavel, 2008) in (Fadun, 2013).

Risk management aims to manage risk so that we can obtain the most optimal results. In the context of the Organization, the Organization will also face many risks. If the organization can't manage risk properly, then the organization can experience significant losses. Therefore the risk faced by the Organization should also be maintained, so that the Organization can survive, or perhaps to optimize risk. The company often deliberately take certain risks, because see potential benefits behind those risks (Hanafi, 2014).

Risk management is essentially done through the following processes (Hanafi, 2014):

a. Risk Identification
   The process of risk identification performed i.e. aims to identify all types of risk inherent in every functional activity that can potentially harm the company.
b. Evaluation and risk measurement
   The next step is the risk measure and evaluate those risks. The purpose of the risk evaluation is to understand the characteristics of the risk better. If we gain the better understanding, then the risks will be more easily controlled. A more systematic evaluation was conducted to "measure" the risk.
c. The Management of Risk
   After analysis and evaluation of risks, the next step is manage risk. The risks should be managed. If organization fail to manage risks, the consequences are received can be quite serious, such a great loss. The risk can be managed in various way, such as avoidance, retention, diversification, or to transferred to other parties. Closely related to risk management is risk control and risk financing.

2.2Product Quality

According to Kotler and Armstrong (2012;283) product quality is the ability of a product to perform its functions which include durability, reliability, accuracy, ease to operation and repair, as well as other attributes. While according to Goetsch and Davis (1994) in Tjiptono and Chandra (2012;152) that the product quality is dynamic condition related to goods, services, people, products and environment that meet or exceed expectations. When the product has been able to run its functions can be

described as a product that has good quality.

According to Kotler (2008;330), most of the product are provided on one of four quality levels; low quality, medium average quality, good quality and very good quality. Some of the above attributes can be measured objectively.

2.3Joint Venture

A contractual agreement joining together two or more parties for the purpose of executing a particular business undertaking all parties grant to share in the profits and losses of the enterprise (Zirape & Warudkar, 2016).

a. Shared contribution of equity
b. Shared authority, control and responsibilities
c. Shared Revenues & Losses
d. Shared Assets

There are many benefits of forming a Joint Venture over the conventional form of carrying on business, like providing companies with the favourable circumstances to gain access to greater resources, new capacity and expertise, and capital particularly in terms of staff and technology, sharing of risks with the venture entities and the limited life span of joint ventures (Tangri, 2013).

3.RESEARCH METHODOLOGY

This is a qualitative research. Case study approach is used in the study. This

research was conducted with interviews and observation directly in the field. This research consists of primary and secondary data. Primary data obtained through interviews, while secondary data obtained through internal data Widuri Joint Venture Group, library, journals, and the internet.

Using a purposive sampling technique. The result using this technique, the selected respondent have the knowledge, skills, and competence in the areas examined. About 3 respondents were interviewed. They are Mrs. Sumiati as the founder and manager of Widuri Joint Venture Group, Mr. Subandi as person in charge and Mrs. Sudarti as one of members and employee at the production.

They are very understanding about the scope of operational activities even associated with the performance of the employees involved in Widuri Joint Venture Group. They are very painstaking and careful about any specific and production process also the distribution.

A semi-structured questionnaire was utilized as a guideline for the interview, where the questions solicited information about potato chips product damaged.

Research on maping method of risk using ERM beginning with the collection of primary data and data secondary. After the data is collected, performed the risk identification at each stage of the business process and the risks are analyzed probability and its impact. After that, the risk evaluated and determined the level of risk, and mapped the risk. When those risk are acceptable by the company only carried out surveillance and monitoring the risk. However, if the risk is not acceptable the company then prepared the risk mitigation strategies and the implication of managerial in the form of supervision and monitoring by the company.

4. RESULT AND DISCUSSION

The first phase in the implementation of this research was conducted by describing the profile of Widuri Joint Venture Group. Based on the first three components of the COSO standards of Enterprise Risk Management Framework internal environment, objective settings, and event identification. After that the whole identification can be obtained potential risk involved in every stage of the business cycle of the company

4.1Internal Environment

This research was conductedat Widuri Joint Venture Group engaged in the home industry at Bintan Regency. Widuri Joint Venture Group was founded in the year 2000 and was founded by Mrs. Sumiati. Widuri Joint Venture Group has 6 members at that time.

Establishment of Widuri Joint Venture Group is aimed at supporting the family economy and also the community particularly the Bintan, situated on Kampung Kolam Renang, Kelurahan Kijang Kota, where the Widuri Joint Venture Group is located. In addition to profit or gain in terms of sheer material, it is also beneficial to the creation of employment.

Widuri Joint Venture Group produce potato chips, sweet potato chips, banana chips, and coconut root (akar kelapa) that has many variants. Widuri Joint Venture Group is also selling other kind of product from many producers. Widuri Joint Venture Group is currently used as the gift shop center for tourists.

For other manufacturers of products sold by Widuri, it doesn't mean that every producer can deposits their product Widuri Joint Venture Group prioritizes the quality of those products. It's not about the benefits that will be gained from it, much of that effort is to keep the brand image of Widuri.

4.1.1 Production Capacity

The production process of potato chips is done every 3 days with production capacity of 30 kilograms of potatoes from Medan. It can produce as much as 11 kilograms.

The selling price for each 1 kilo of spicy potato chips is IDR 100.000. if in 1 time production then gross profit was IDR 100.000 x 11 kilograms = IDR 1.100.000. while the net profit earned is 50% x IDR 1.100.000 = IDR 550.000. in a month the net profit gained from the production of potato chips is IDR 550.000 x 10 = IDR 5.500.000.

4.1.2 Production Process

Sequence of potato chips production process is as follows:

a. The purchase of raw material and other supporting meterials.
b. Peeling the potatoes.
c. Cutting potatoes with electrical grated modified for potato.
d. Washing potatoes already cut or shredded.
e. Soaking overnight by adding lime.
f. Potatoes are drained from the marinade.
g. After the drained, potatoes will enter the process of frying. In this stage the sorting process for the potatoes which stll wet to then fried back.
h. Finished fried, then cooled and stored in a closed container.
i. Process of adding the sauce seasoning with traditional techniques.
j. After given the sauce seasoning and then chill for a moment.
k. Potato chips are ready packed and lebeled.
l. Potato chips are ready to be sold and distributed to customers.

4.2Objective Setting

Objective setting reflected in the four sides of corporate objective by taking into account the potential risk. Objective setting of Widuri Joint Venture Group are as follows:

a. Strategic objective: maintain product quality and improve the local economy.
b. Operating objective: continuously make improvements to both the technical aspects as well as managerial system.
c. Reporting objective: Transparent and accurate report for members of Widuri Joint Venture Group.
d. Compliance objective: comply with local government regulations.

4.3Event Identification

Talking about risk, none of theactivities or jobs that do not have risk in it. So does in business run out in Widuri Joint Venture Group. Various possibilities can occur and pose a risk in doing the production process of potato chips.

4.3.1 The Impact of The Risk Occur

The impact arising from the risk that occur are:

a. The product is destroyed
b. Potato chips become charred
c. The product will be easy to catch cold.

Based on the above explanation, to make it easier for authors to do the discussion and to draw conclusions, the authors make a risk identification table by calculating the frequency of how often the occurence and extent of the impact caused (Table 1). For frequency range number 1-5, calculations based on the amount of production in 1 year. For impact range number 1-5, assuming experienced loss percentage.

Table 4.1Categories of Risk Probability and Risk Impact on Widuri Joint Venture Group

Category of Risk Probability		
Scale	Probability	Frequency
1	Very Rare	< 5 times
2	Rare	5-10 times
3	Quite Often	10-20 times
4	Often	20-30 times
5	Very Often	> 30 times
Risk Impact Categories		
Scale	Impact	Indicator
1	Very High	100%
2	High	60%
3	Moderat	40%
4	Low	10%
5	Very Low	5%

Source: Proceed Data

Following is the table that contains the identification of risk and their frequency ofoccurence and the impact.

Table 4.2 Risk Identification

No	Risk Identification	Frequency	Impact
R1	Error in the selection of raw materials	2	5
R2	Passing the process of soaking potatoes	2	5
R3	A mistake in the provision of lime paste	2	4
R4	Errors at uncontrolled fire	5	2
R5	Human error	3	4

Source: Self Proceed

4.3.2 Risk Mapping

After getting the result of the identification of risk and their frequency of occurence and the impact caused, then we can make likelihood-impact matrix.This matrix aimed to ease the company so they may perform the anticipation or prevention. A risk with a high level will get a major concern which must be anticipated and prevente

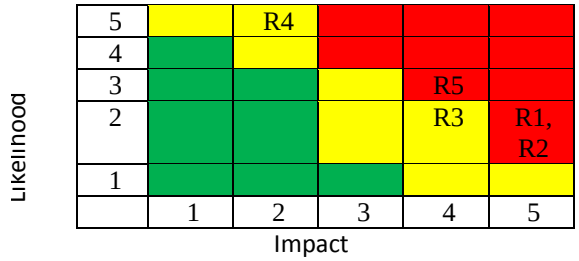

Figure 4.1Likelihood Impact Matrix
Source: Data Proceed

Based on the matrix above, there are some explanation:

a. Color green means that the risk are on the severity of low.
b. Color yellow means that the risk are on the severity of medium.
c. Color red means that the risk are on the severity of high.

Based on the above matrix can also be noted that:

a. R1 (Error in the selection of raw materials), is a risk with high severity. Even though the frequency of occurence is rare, if the risk occurs will give a hugh impact. For Widuri Joint Venture Group, if an error occurs in the purchase of raw material that are not derived from Medan or Bukittinggi, so a product produce is product failed. Because the whole potato chips is not crisp and not appropriate the quality standard of potato chip of Widuri Joint Venture Group.
b. R2 (passing the process of soaking potatoes), is a risk with high severity. Even though the frequency of occurence is rare, if the risk occurs will give a hugh impact. As if in 1 chips production time does not pass through the process soaking overnight, of course the result is not appropriate.
c. R3(A mistake in the provision of lime paste), is the risk with moderate severity.
d. R4 (errors at uncontrolled fire), is the risk with moderate severity. In this case only a small portion of the potato chips product fail due to a large fire causes make easily scorched. While most of the others are still in expected quality standard of Widuri Joint Venture Group.
e. R5 (Human error), is the risk with high severity. Because it happens in a frequency quite often and giving a high impact. Negligence on employees can happen when store the potato chips into jar or container, neglect can also occur while saving the potato chips into a jar, but the chips has not been properly prepared for the process storage because it is still somewhat hot, so that when they fully in jar it will be easy to catch cold, and negligence can also occur because of the lack of thoroughness of employee when sorting process. Of course this can lead to damaged product, and it cannot be sold and so raises a very big loss for Widuri Joint Venture Group.

4.3.3 Risk Response and Recommendation

After risk identification and risk mapping, mext is doing the response to risk encountered. This is the following explanation:

Table 4.3Risk Response and Recommendation

Risk	Level	Response	Recommendation
R1	High	Minimize the risk	Carefully inspection at any raw materials when purchasing the raw material.
R2	High	Minimize the risk	Make an auto reminder alert or alarms that systematicallyas a reminder flag of soaking process to be done.
R3	Medium	Minimize the risk	Create a measure or standard size composition of lime. In accordance with the amount of production. For example, 1 ounce lime for 5 kilos of potatoes.
R4	Medium	Minimize the risk	Modify the stove with cover around its axis so that its not exposed to the wind and the fire remains stable.

R5	High	Minimize the risk	Providing in depth training and knowledge about production process and procedures. If possible give a sanction over the negligence committed.

Source: Data Proceed

5. CONCLUSION

The results showed that there are several factors that can cause product damaged which was an error in the selection of raw materials, passing the process of soaking potatoes, a mistake in the provision of lime paste, errors at uncontrolled fire, and human error that have impact for entity. The impact of arising from risk was product destroyed, potatoes become scorched, and the potato chips would be easy to catch cold. The amount of risk experienced by Widuri joint venture group were reflected in the risk map formed on the measurement of risk based on probability and impact (likelihood-impact matrix). Widuri joint venture group certainly have to develop a strategy for an effective risk mitigation were prioritized addressing the highest risk first to a lower risk so that the risk of product damaged can be minimized.

REFERENCES

Ahmed, I., & Manab, N. A. (2016). Influence of enterprise risk management success factors on firm financial and non-financial Performance : A Proposed Model. *International Journal of Economics and Financial Issues*, *6*(3), 830–836.

COSO. (2017). Enterprise Risk Management Integrating with Strategy and Performance. *Committee of Sponsoring Organizations of the Treadway Commission*, (June). Retrieved from https://www.coso.org/Documents/2017-COSO-ERM-Integrating-with-Strategy-and-Performance-Executive-Summary.pdf.

Fadun, O. S. (2013). Risk management and risk management failure: Lessons for business enterprises. *International Journal of Academic Research in Business and Social Sciences*, *3*(2), 225–239.

Fahmi, Irham. (2010). *Manajemen Risiko: Teori, Kasus dan Solusi*. Bandung: ALFABETA.

Hanafi, M. M. (2014). Risiko, Proses Manajemen Risiko, dan Enterprise Risk Management, 1–40.

Kotler, Philip. (2008). *Manajemen Pemasaran*. Edisi Keduabelas. Jilid Kedua. Jakarta: Indeks.

Kotler, P., & Armstrong, G. (2012). *Prinsip-prinsip Pemasaran*. Edisi Ketigabelas. Jilid Pertama. Jakarta: Erlangga.

Luppino, R., Hosseini, M. R., & Rameezdeen, R. (2014). Risk management in research and development (R&D) projects: The case of South Australia. *Asian Academy of Management Journal*, *19*(2), 67–85.

Mulyadi. (2012). *Akuntansi Biaya*. Edisi Kedua. Cetakan Sebelas. Yogyakarta:UPP STIM YKPN.

Mustapha, M., & Adnan, A. (2015). A Case Study of Enterprise Risk Management Implementation in Malaysian Construction Companies. *International Journal of Economics and Financial Issues*, *5*(2), 70–76.

Nikou, S. H., & Selamat, H. (2013). Risk Management Capability within Malaysian Food Supply Chains. *International Journal of*

Agriculture and Economic Development, *1*(1), 37–54.

Tangri, S. (2013). Significance Of Unincorporated Joint Venture Agreements In India Vis-A-Vis Liabilities Of Partners. *International Journal of Research and Analysis*, *1*(2), 438–452.

Tjiptono, F.,& Chandra, G. (2012). *Pemasaran Strategik.* Edisi Kedua.Yogyakarta: Andi.

Wiryani, H., Achsani, N. A., & Baga, LM. (2013). Pemetaan Risiko Di Industri Penyamakan Kulit Dengan Pendekatan Enterprise Risk Management (ERM). *Jurnal Manajemen & Agribisnis*, *10*(1),50–59.