Measuring the efficiency of logistics channels

Chutidaj Munkongtum [a] , Supat Prapart [b] , Sumalee Ruengpracha [c] , Supaporn Kortrsongkram [d], Jirathwat Siributr [e]

[a-d] Faculty of Business Administration in Logistics Management Bangkokthonburi University, Thailand.
[e] Faculty of Business Administration, Department of General Management Bangkokthonburi University, Thailand

Abstract: The researcher aims to study Measuring the efficiency of logistics channels with the purpose of research to study the testing of performance measurement tools (Performance) of logistics channels and evaluate the testing of that tool and bring effective performance measurement tools to use in the operation of logistics channels in the future. By collecting data from 515 persons Tran Slink Co., Ltd. employees and using the questionnaire as a tool. Statistics used to analyze the data were t-test, F-test (ANOVA and MANOVA), multiple correlation analysis, and multiple regression analysis.

The results showed the relationship between the independent and dependent variables By analyzing multiple regression (Multiple regression analysis), a method for selecting variables into the equation so that the equation can predict the maximum variable criteria. There is a method for selecting variables by using Forward regression analysis. It can be concluded that the variables selected into the equation are quality dimensions using Item Fill Rate indicators. And the cost dimension by using the Logistics cost per unit and Cash Conversion Cycle indicators has a multiple correlation coefficient (Multiple R) equal to 0.842, a coefficient of determination (R Square) equal to 0.709, and an adjusted coefficient (R Square). 0.674 Standard error in the system (Standard Error) 26.830 The results of the correlation test between the efficiency of logistics channels (Y1) found that the quality dimension using the indicator Item Fill Rate (X1) had a P-value equal to 0.001, less than 0.05 ($0.000 < 0.05$). And the cost dimension using Logistics cost per unit indicator and Cash Conversion Cycle (X3) has a P-value equal to 0.001, less than 0.05 ($0.000 < 0.05$), that is, the main assumption is rejected. Ho The H1 sub-hypothesis is accepted, implying that the quality dimension using the Item Fill Rate metric and the cost dimension using the Logistics cost per unit and Cash Conversion Cycle metrics influence the efficiency of the logistics channel. It can be written as a regression equation as follows: $Y=103.789 + 1.455 (X1) + 3.035 (X3)$.

Keywords: Measuring the efficiency, logistics channels,

Background

From the economic overview in the fourth quarter of 2021, the Thai economy grew by 1.9% year on year, improving from the contraction in the third quarter at 0.2% year on year. For the year 2021, the Thai economy grew by 1.6% year on year. per year, improving from the contraction in 2020 at 6.2% year on year. private consumption and various investments grew by 18.8%, 0.3%, and 3.4%, respectively. Headline inflation was 1.2% and the current account deficit was 2.2% of GDP. The export value in Q4 2021. an increase of 21.3%, higher than the previous quarter's 15.7% growth. The export volume index grew 16.8%, up from 12.2% in the previous quarter. Export prices rose 3.8%, compared with last quarter's 3.1% increase. for production Transport and Storage Sector Up 3.2% in Q4 2021. This was up from a 1.4% contraction in the previous quarter.

Followed by the acceleration of air cargo. and the continuous expansion of water transport The Thai economy in 2022 is expected to expand in the range of 3.5% - 4.5%, driven mainly by a recovery in domestic demand. recovery of domestic tourism. The continued expansion of merchandise exports and support from government investment The value of merchandise exports is expected to expand. 4.9%Meanwhile Private consumption and investment are expected to increase by 4.5% and 3.8%, respectively, and public investment is expected to increase. 4.6% Headline inflation is expected to be in the range of 1.5% - 2.5%. The current account is expected to be in a

surplus of 1.5% of GDP. Knight Frank. Thailand said the total supply of ready-made warehouses accounted for 4.73 million square meters. Warehouse space increased by 78,955 square meters compared to the first half of the year, an increase of 3.5% year on year, mainly due to Tip Industrial, a large local developer in Samut Prakan province. This modest growth coincides with new levels of supply since 2017, pointing to a shift in the trend toward build-on-demand warehouses. (build-to-suit) instead of prefabricated warehouse speculation Custom-built warehouses allow logistics developers to mitigate the risk of post-development space. Bangkok and its vicinity still hold the largest market share. In the second half of 2021, supply in the area grew 7.5% year on year to 2.2 million square meters, accounting for 47.1% of the total ready-made warehouse supply. The new supply will be along Bangna-Trad Road in Samut Prakan Province. This is an area that already has a lot of new supply and is a good location in between Bangkok. with the Eastern Economic Corridor development project. The rapid growth of e-commerce during the COVID-19 pandemic has strengthened Samut Prakan Province As a prime logistics area Especially with last-mile logistics because this area is close to Suvarnabhumi International Airport, supply in the eastern seaboard and central regions remains. There has been no change since the previous half of the year. with a market share of 36.8% and 15.6% respectively. Neither of these areas has seen significant growth in recent years. especially in the central region. Demand in the second half of 2021, the take-up rate soared by more than 186,000 square meters, reaching levels not reached since before the outbreak of COVID-19. The vacant area in this half year accounted for about 42,000 square meters. This resulted in a positive net absorption rate of 144,000 square meters, representing a 2.8-fold growth from the previous half. And representing a 189% year-on-year growth, so the total occupied area grew 4.8% year-on-year to 4.01 million square meters. It shows an occupancy rate of 85%, the highest in the last ten years. Demand continues to be primarily driven by e-commerce-related operators. and logistics companies (3PLs) that expand their business according to consumer behavior that shifts to online shopping.

Pig.1. logistics real estate market (https://www.bangkokbiznews.com)

1. Methods

This study was conducted using a qualitative design. The research was conducted in the form of mixed methods research that included quantitative and qualitative research. By collecting data from 515 persons Tran Slink Co., Ltd. employees and using the questionnaire as a tool. Statistics used to analyze the data were t-test, F-test (ANOVA and MANOVA), multiple correlation analysis, and multiple regression analysis.

2. Results

Multiple correlation coefficient (R), coefficient of prediction (R^2), and statistical significance, stepwise multiple regression analysis.

Model	Sum of Squares	df	Mean Square	F	P-value
Regression	22345.173	1	22345.173	20.472	.000a
Residual	19647.027	18	1091.502		
Total	41992.200	19			
Regression	29755.039	2	14877.519	20.668	.000c
Residual	12237.161	17	719.833		
Total	41992.200	19			

Multiple R   0.842
R Square   0.709
Adjusted R Square   0.674
Standard Error 26.830

The variables that were selected for the equation were the quality dimension using the Item Fill Rate metric and the cost dimension using the Logistics cost per unit and Cash Conversion Cycle metrics with a Multiple Correlation Coefficient (Multiple R) of 0.842. Decision (R Square) equal to 0.709 Adjusted working coefficient (Adjusted R Square) 0.674 Standard error in the system (Standard Error) 26.830.

Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	P value	Correlations			Collinearity Statistics	
	B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
ค่าคงที่ (Constant)	103.789	12.583		8.248	0.000					
(X₁)	1.455	0.454	0.468	3.208	0.001	103.789	-.614	1.455	0.454	0.468

(X₃)	3.035	0.845	0.524	3.592	0.001	103.789	0.321	3.035	0.845	0.524

Significance at the 0.05 level.

The results of the correlation test between the efficiency of logistics channels (Y1) found that the quality dimension using the indicator Item Fill Rate (X1) had a P-value equal to 0.001, less than 0.05 (0.000 < 0.05). And the cost dimension using Logistics cost per unit and Cash Conversion Cycle (X3) indicators has a P-value equal to 0.001, less than 0.05 (0.000 < 0.05). That is, rejecting the main hypothesis Ho accepts the secondary hypothesis H1, implying that the quality dimension using the Item Fill Rate metric and the cost dimension using the Logistics cost per unit and Cash Conversion Cycle metrics influence the efficiency of the logistics channel. Unique Translink Co., Ltd. can be written as a regression analysis equation as follows:

$$Y = 103.789 + 1.455 (X_1) + 3.035 (X_3)$$

4. Discussion

The results were discovered in this study.

1. In future studies, more diverse methods of data collection should be selected.
to support a diverse group of employees in terms of nationality, religion, and data collection area. This information will be useful for further business development.
2. Business operators should study and analyze the feasibility. in expanding branch locations Comprehensive management covering the changing market in a direction that is in line with the current market.

5. References

1. Caidingping. Statistical analysis of the modern logistics industry and the national economy[J]. Logistics, 2006, 3 vol.21, no.1, Mar.
2. China Statistical Yearbook 2005, National Bureau of Statistics, 2005.
3. Fangqiuyan. Analysis of the interaction between economic development and the logistics industry[J]. Logistics Technology, 2005, no.3:11.
4. Huanghai, Xutao. Analysis of the relationship between economic development and the logistics industry[J]. Logistics Technology, 2006, vol.3, no.2:112.
5. Huanglijin. Network Economy and modern logistics[J]. Theory Perspective, 2002, no.5:15.
6. Khomsan Laosillapacharoen(2018) The Strategy for Increasing Exported Quantity of Thai Furniture Industry, ACADEMIC JOURNAL BANGKOKTHONBURI UNIVERSITY Vol.7 No.1 January - June 2018P.30-43.
7. Li, Yang, Liu. The empirical study of the relationship between the logistics industry and the national economy[J]. Journal of Wuhan University of Technology, 2006, no.6:8.
8. Lixiaoxi. Logistics and the development of China's economy[J]. Modern Logistics, 2004, vol.4, (in Chinese)
9. Liu Nan, Li Yan. The relationship between economic growth and modern logistics[J]. Project Management Journal, 2007, no. 1:151.
10. Liupengfei, Xieruhe. Logistics and economic relations[J]. China Logistics and Procurement, 2003.
11. Liupengfei, Xieruhe. Logistics and economic relations[J]. Academic Research, 2004, vol.19, no.1: 68-71.
12. Marc Juhel, the role of the logistics industry in the economy[J]. Logistics Technology, 2002, no.2:41.
13. Maliqiang, China's economic development needs the establishment of a modern logistics system[J]. Logistics Forum, 2006, no.33:152.
14. Shangjin, Yangyou, Lixiaohoong. Cluster analysis and examples discriminant of economic development in the region[J]. West China Normal University, 2005, no.2:263.
15. The impact of economic development on the development of the logistics industry empirical study [J]. Produced by the Forum, 2003:38.
16. Wangyanhua. The economic development and modem logistics[J]. Modem Logistics, 2006, no.5:67.
17. Wangjun. Empirical analysis of China's logistics industry in economic growth[J]. Academic Research, 2005, no.2:20.

18. Wangzuo. Logistics development[J]. Logistics Technology, (in Chinese)2006:24.
19. Wangxuhui. The development of the logistics industry in Japan[J]. Modem Japanese Economy, 2005, no.2:25.
20. Wujining. Logistics industry and economic growth[J]. Logistics Technology, 2006, no.6:13.
21. Zhangwenjie. Regional economic development and logistics[J]. Logistics Technology, 2004.
22. Zhaoxujie. Statistical analysis and forecast of economic growth and logistics industry[J], 2004, vol.29, no.5:887-890.
23. Zhu Hong-wen(2007)The Research on the Relationship between Economy Development and Logistics Development Based on Statistical Analysis. International Conference on Management Science and Engineering (ICMSE)