Cost Efficiency of Sea Freight and Lowering Cost of Consumption Goods

Muh Rum
Academy of Public Manajemen Makassar, Jl. Maccini Tengah No.48, South Sulawesi 90144, Indonesia
Email: r12um@yahoo.co.id

Abstract. The subject of this research are administrative processes related to loading and unloading cost in term of a ship’s arrival and departure to seaports, typically attributed to elevated levels of cost of labor, handling cost, dwelling time, and port fee which required to complete the related administrative tasks. Research design by comparative method in administrative way, which compare with many way implemented of previous practitioner export and import. In the previous phases of the research, an average expected cost of the administrative labor cost in traditional seaport clusters in eastern Indonesia was identified and quantified on an hourly basis. This research continues in its aim by using the results of the previous research as a starting point, and Find that enterprise resource planning and improvement, transactional due diligence and merger integration, positively affect and not associated with cost reduction. Moreover variable of reducing inventory cost affect and associated with reducing cost. The main hypothesis is that the usage of such a new model will result in a measurable decrease of the required freight cost in sea port, which indirectly reduce the consumption goods.

Keywords: sea freight, cost efficiency, unit cost handling, consumption goods

1. Introduction

Indonesia is the largest archipelagic country in the world, has an area of 7.7 million km², with an area of two-thirds of Indonesia's sea, and the fourth longest coastline in the world along 95,181 km, and has 17,480 islands having economic potential in sea transport services is very large, because it is inevitable that sea transportation (ships) is a major means of transportation to reach and connect the islands in the archipelago, creating inter-island connectivity in Indonesia. Due to the vital importance of transportation for the economy, sea transport must be developed properly and properly to support economic growth. If sea transportation is disrupted, then the national economy will also be disrupted. One of the strategies of acceleration and expansion of national economic development is to promote strengthening connectivity between islands, especially outer islands. This connectivity can only be realized if the marine transportation in the archipelago country continues to be played significantly. Since the days of the Hindu-Buddhist kingdom, the Port has become one of the means connecting the trade and defense resources of the Kingdom in Indonesia. As the times progressed, the role of ports was needed to support various fields in a country. Definition and role of Harbor according to Law no. 21 of 1992 concerning shipping is a place consisting of the land and the surrounding waters with certain limits as a place of government activity and economic activity which is used as a place to lean anchor ship, up and down passengers and loading and unloading of goods equipped with safety facilities and activities of shipping Supporting ports as well as intra and intra-modal transport.

The function of sea transportation is essentially to transport passengers or goods from one place to another separated by the territorial waters. With the existence a sea transportation it can help the creation of national distribution patterns. However, in order to achieve this it is necessary to have an effective, efficient and safe marine transportation system. The movement or movement of passengers and goods is the basis of trade. Through the means of sea transportation, raw materials and goods produced from one region can be marketed to other areas. Indonesia, as the largest archipelago country in the world, desperately needs sea transport that can reach all its territory. Indonesia is an archipelagic country with a vast sea area, two-thirds of which is waters and located in a strategic location because it is located in the stop of world trade route. As an archipelago, the role of the port is...
vital in the Indonesian economy. The presence of an adequate port plays a major role in supporting the mobility of goods and people in this country. Ports become the most important means to connect between islands and between countries. The port is one of the most important trading chains of all trade processes, be it inter island or international trade. As the intersection of land and sea transportation, the role of the port becomes vital in promoting economic growth, especially its hinterland areas where the movement of goods and humans in large quantities. As part of the transportation system, ports play an important role in the economy.

The port in Indonesia is very important in the flow of the economy in Indonesia, even in the world. This is where the process of export and import goods. Because the activities at the harbor are vital to the economy, then all processes must be done perfectly. If the port service occurs dysfunctional then it will affect the price of goods to be received by consumers. In the practice of port services, known as the process of loading and unloading of goods is also called the dwelling time or the residence time of goods within the port area. The length of the dwelling time process depends on the infrastructure, the maintenance of the license, and from the company itself. Ports can play a role in stimulating the growth of economic, commercial, and industrial activities from their spheres of influence. But the port does not create such activities, but only serves to grow and develop these activities. Such activities enhance the role of the port from merely as a vessel to the center of economic activity. In principle, the relationship of development activities by humans in the sea cannot be separated with on the beach even on land entirely. Ports become a means of the rise of inter-island trade and even trade between countries, ports in an area will be more stimulating wheel rotation of the economy, various types of business

There are many reasons to improve transit evaluation. Current transportation evaluation practices tend to overlook and undervalue many transit benefit categories, such as parking cost savings, increased safety from reduced vehicle travel, and reduced chauffeuring burdens on drivers [1]. More comprehensive analysis includes more impacts and so is more accurate. This is not to suggest that every transit project is cost effective or that transit is always the best solution to every transport problems. However, transit improvements tend to provide significantly more value to society than conventional models indicate. There are four general categories of transit improvements to consider:

a. Increased service (more transit vehicle-miles)

b. Improved service (more comfortable, convenient, reliable, etc.).

c. Transit use incentives (lower fares, commuter financial incentives, marketing, etc.).

d. Transit oriented development (land use patterns designed to support transit, including more compact, walkable, mixed development around transit stations and corridors).

The port volume is called to be one of the main indicators of port performance. It is easiest to perform performance comparisons between one port and the other. The port of a connectivity, its comparability can be seen from the increase in volume, if the port is said to be good but there is no increase in volume that is nonsense, said Minister of Transportation Budi Karya Sumadi. Efforts to increase the volume, should be encouraged by improving the various port services, such as increased security and service to stakeholders. Budi also emphasized the importance of improving services to shipping line and producers in order to increase volume. The need for ports to make alternative services for foreign shipping line more interested to come.

The opening of transportation by sea will open the economic path. The principle of trade follow the ship is one effort to stimulate the Indonesian economy. Increased volume at the port is one indicator of the running of the economy in an area, moreover the sea toll is working to increase the inflows and exports of goods, especially from eastern Indonesia. And the sea toll with logistics warehousing can increase the volume of trade in eastern Indonesia, the increase in port volume can boost economic growth in Indonesia, hoping the economic increase could be 5.7 percent or 5.8 percent[2].

South Sulawesi is the driving force of the economy in eastern Indonesia. This is because the export potential of South Sulawesi is very diverse. Among others in the fields of agriculture, fisheries (shrimp, fish and seaweed), tourism, agriculture (cocoa, coffee beans, corn, and cloves), mining
(nickel) and forestry. One of South Sulawesi's mainstay is cocoa potential whose production reaches an average of 330,000 tons per year and become the largest contributor to export. Even President of Republic Indonesia Jokowi is pleased to hear that export products have expanded to 27 export commodities. Ranging from Frozen Shrimp, Tuna Frozen Crab Meat, Octopus Frozen, Fresh Fish, Cocoa Beans, Cocoa residues, Cocoa Powder, Coffee Arabica, Fruit Passion Fruit, Corn, Marble, Wood Processing, Seaweed, rubber, Live Fish, Fish Fillets, Oil Nut, Cashew Peel, Skin Ari Mete, Wheat Flour, Wheat Bran, Incense, Flying Fish Eggs, Reptile Skin, Cement to Nickel. Export destinations also varied to 24 destination countries. Namely the United States, Japan, South Korea, Italy, Puerto Rico, Germany, Malaysia, Singapore, Hong Kong, Philippines, Denmark, Britain, China, Poland, Dubai UAE, Kuwait, Saudi Arabia, Ukraine, Spain, Israel, the Netherlands, Vietnam, Australia, And Timor Leste. Diversification of export destination countries from traditional markets to emerging markets is urgently needed in the future [3][6]

Feel looks lazy when spoken about the prospect of his business in eastern Indonesia, such as the clothing trader with the huge cost of delivering goods from Jakarta to areas in Eastern Indonesia. In addition to shipping costs are quite expensive, moreover the goods that are sent often do not get in time. This is caused by the lack of modes of transportation. The same complaint is also of a resident from Merauke, Papua about the procurement of instant noodle product shopping, sugar, wheat, in the area is quite expensive. Just because the goods are from the factory on the island of Java that we must buy expensive. Complaints both become opaque portraits for other business world, so less tasteful in aiming for investment to the east of Indonesia. Indeed, inadequate infrastructure such as electricity, clean water, road and port conditions, became a ghost inhibiting investment. Commonly the supply of goods to the eastern regions due to the condition of port infrastructure and roads that are less conducive, resulting in swelling logistics costs. Port development and road infrastructure improvement, we hope to support the business growth.

The gap of development of the western and eastern regions, as a result of the implementation of efficient logistics management as an archipelagic country. The sea transportation system from Jakarta and Surabaya to some areas in Eastern Indonesia has not been well integrated. Ideally to build eastern Indonesia, it must start from the revamping of port infrastructure. As the Port of Makassar, dubbed the East Indonesia entrance, needs to be pushed into a major port in Eastern Indonesia, thus overcoming the unbalance constraints of the loading and unloading of goods that generally occur in ports in Eastern Indonesia.

The importance is about connectivity between ports in Indonesia, as the strategies of acceleration and expansion of national economic development is to promote the strengthening of inter-island connectivity, especially the outer islands and maintain the balance of the western and eastern regions of Indonesia.

2. Method

The research design is based on descriptive and associative method how to reduce freight cost in sea port, which can affect to the cost of consumption goods in central and eastern Indonesia. This survey consists of the factors that previous studies stated which might affect sea port cost. This survey was distributed over a random sample of practitioner import in Makassar Port, through the number of vessel loading during the year of 2016. Sample data collected about 30 of stevedoring activity in Makassar Port, applied technical research by multiple regression models.

Research design by doing comparative method among the several exporters and importers from many countries with the importer and exporter in the Port of Makassar. This comparison In terms of loading and unloading time and loading and unloading costs So it can be known whether the mechanization of unloading equipment loading and warehouse procurement able to improve performance loading and unloading method like what is optimal and profitable to the port management. The comparative implemented method showed in table 1, which the author can combine the whole method to reduce freight cost in Makassar port even in eastern Indonesia area of port. These factors should be considered when evaluating public transit benefits and costs:
a. Public transit can provide various types of impacts. Comprehensive evaluation should consider all significant benefits and costs.

b. Many transit services (those that operate at times and places with low demand) exist mainly to provide basic mobility for non-drivers. Although relatively costly per trip, they are often cheaper than alternatives such as taxis and chauffeuring (drivers making special trip to carry non-drivers, which often requires empty return trip), or inadequate mobility for non-drivers.

c. High quality (relatively fast, convenient, comfortable and integrated) transit can attract discretionary travelers who would otherwise drive, which reduces traffic problems including congestion, parking costs, accidents and pollution emissions. Transit that attracts discretionary travelers provides consumer welfare (surplus) benefits, since they would not change mode if they did not consider themselves better off overall.

d. High quality transit can stimulate transit-oriented development, compact, multi-modal neighborhoods where residents tend to own fewer vehicles, drive less and rely more on alternative modes than in more automobile-oriented communities. This can leverage additional travel reductions and benefits (besides just the travel shifted to transit).

e. Traffic congestion tends to maintain equilibrium: it increases until delays discourage additional peak-period vehicle trips. High quality, grade-separated transit can reduce traffic congestion costs by reducing the point of equilibrium, offering travelers an alternative to driving, and by supporting compact development which reduces travel distances.

f. Highway expansion tends to induce additional vehicle travel which increases external costs such as downstream congestion, parking demand, traffic risk, barrier effects, and pollution emissions, costs that are avoided if travelers instead shift to public transit. These impacts should be considered when comparing roadway expansions with transit improvements.

g. Transit travel time unit costs (dollars per hour or cents per minute) vary significantly depending on travel conditions and user preferences. Many travelers prefer high quality transit even if it takes longer than driving because they can work or rest.

h. These impacts and benefits tend to increase if transit improvements are implemented with support strategies such as walking and cycling improvements, more compact development, transportation demand management programs, and efficient road and parking pricing.

i. Since active transport (walking and cycling) and public transit are complements, transit travel tends to increase public fitness and health.

j. Public transit services have three features that justify public support and underpricing: they help achieve social equity objectives, they experience scale economies, and they can reduce various external costs including traffic congestion, accident risk and pollution emissions.

k. Current demographic and economic trends (aging population, rising fuel prices, urbanization, changing consumer preferences, increasing health and environmental concerns) are increasing demand for transit and transit-oriented development, and therefore their benefits.
### Table 1. Comparative Method of Practitioner in Seaport

| Name                | Background                                                                 | Implemented Method                                                                 | Variable Output                                                                 |
|---------------------|----------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| David Martinelli    | Independent Principal with Blossom Growth and specializes in: Manufacturing and operational efficiency, ERP and software implementation and improvement, Transactional due diligence and merger integration. | ERP (Enterprise Resource Planning) and software implementation and improvement, Transactional due diligence and merger integration. | Enterprise Resource Planning and improvement, Transactional due diligence and merger integration. |
| Bryan Mattimore     | The Cofounder and Chief Idea Guy at Growth Engine, Innovation Agency. He’s the author of ‘Idea Stormers, How to Lead and Inspire Creative Breakthroughs. | Create a consortium of buyers (our client and several of their suppliers) to buy needed logistics supplies (i.e. transportation fuel) at a reduced cost that comes with buying in greater quantities. | Create a consortium of buyers. |
| Brian Stutzman      | Investor in franchise ownership with BlueGrace Logistics. With an operation location in Indianapolis, IN but with a worldwide reach, Brian and his team are focused on becoming a part of a new standard in the third party logistics industry. | Implement more stream-line processes or reporting that saves your transportation and accounting teams time. | Implement more stream-line processes. |
| Scott Stone         | Director of Marketing for Cisco-Eagle, a provider of integrated material handling systems for industrial operations. Scott has over 23 years experience in industrial operations and marketing. | Truly understand its costs—per pallet, per sku, per order shipped, etc, and Every project should be seen through the prism of labor costs which can be addressed in multiple ways. | Unit Cost Handling. |
| Brian Sutter        | Director of marketing at Wasp Barcode Technologies. He succeed to minimized the Inventory cost through holding goods in stock. | Reduce your inventory cost, chances are you’re stocking too much inventory. Know Your Up-to-Date Inventory Levels: Keeping track of your inventory levels is the most straightforward way to prevent overstocking inventory and, as a result, reduce inventory cost. | Reducing your inventory cost. |
| Richard McGirr      | Marketing manager at floship, an e-commerce logistics company based in Hong Kong. | Have one distribution center in a major logistics hub, such as Hong Kong, that can service a very large area or possibly even the entire world from one location. | Build a distribution center in a major logistics. |
| Bob Shirilla        | The Owner / Manager – Simply Bags – Leading US distributor of personalized and custom tote bags. | Our marketing starts with an analysis of supplier locations and potential clients in the same region. For example, we are doing a marketing campaign targeting Beach Wedding Planners and have developed a business relationship with two manufactures in Florida. This gives us a competitive price advantage over other suppliers that have higher shipping cost. | Analysis of supplier locations and potential clients in the same region. |
Chuck Intrieri  Management consultant at Charles M. Intrieri Consulting. A highly experienced supply chain professional. Collaborate and partner with Suppliers to help reduce costs. By create a consortium of buyers (a client and several of their suppliers) to buy needed logistics supplies (i.e. transportation fuel) at a reduced cost that comes with buying in greater quantities.

Martin Murray  A senior supply chain management consultant and author of several books on supply chain using enterprise resource planning (ERP) software, Martin Murray has been the About.com expert for logistics and supply chain since 2008. Use a single source for a range of products that a single vendor can provide. The same can be achieved for transportation. By offering all transportation out to bid, via a RFQ (Request for Quotation), a company can provide carriers with a detailed explanation of what they require, which may fall outside of what is normally provided by a common carrier.

Rob O’Byrne  Owner and group managing director of specialist management consulting firm Logistics Bureau, based in Australia and southeast Asia. Cost reduction starts with fully understanding all costs and separating them into variable and fixed costs. Variable costs fluctuate with volume (truck fuel, direct labour, packaging, etc.) while fixed costs don’t (rent). The major cost components we will review in this class include:
- labor (direct, indirect and temporary staff vs. permanent staff)
- stock loss
- distribution
- packaging
- the cost of low productivity
- the cost of poor quality
- utilities (electricity, heat, water)

Fully understanding all costs and separating them into variable and fixed costs.

Alex Stark  Modern Marketing Expert and Supply Chain Collaboration Evangelist for Kane Is Able, Inc. Allocating available inventory against current orders creates problems. Integration of sales and inventory data.

3. Research Hypotheses

After reviewing the literature that covered the topic of how to reduce the freight cost in sea port, the researchers developed the following hypotheses that were set out to achieve the study objectives:

H 1: Enterprise Resource Planning and improvement, Transactional due diligence and merger integration affects the sea freight cost efficiency.
H 2: Create a consortium of buyers affects the sea freight cost efficiency.
H 3: Implement more stream-line processes affects the sea freight cost efficiency.
H 4: Unit Cost Handling affects the sea freight cost efficiency.
H 5: Reducing your inventory cost affects the sea freight cost efficiency.
H 6: Build a distribution center in a major logistics affects the sea freight cost efficiency.
H 7: Analysis of supplier locations and potential clients in the same region affects the sea freight cost efficiency.
H 8: Use a single source for a range of products affects the sea freight cost efficiency.
H 9: Fully understanding all costs and separating them into variable and fixed costs affects the sea freight cost efficiency.
H 10: Integration of sales and inventory data affects the sea freight cost efficiency.

Source: Angela Stringfello [10]
4. Data Analysis Procedures

This research implements a number of statistical techniques and procedures that help to examine research hypotheses. These techniques include reliability and validity test, frequency analysis, independent sample t-test, descriptive statistics, correlation matrix, linear regression, and simple regression. All statistical procedures were estimated using path analysis with Smart PLS implemented.

5. Models

The research model is estimated is direct to reduction cost measure in statistical model

\[ \eta_1 = \Phi_1 \xi_1 + \Phi_2 \xi_2 + \xi_1 \] or not as Red Cost= \( \Phi_1 \) ERP + \( \Phi_2 \) Cons +\( \Phi_3 \) line Proc + \( \Phi_4 \) Unit Cost + \( \Phi_5 \) Red Invent + \( \Phi_6 \) Dist Cent + \( \Phi_7 \) Supp Loc + \( \Phi_8 \) Sing Source + \( \Phi_9 \) Sept Cost + \( \Phi_{10} \) Integ Sel Invent +\( \xi_1 \). The partial Least Square (PLS) Estimation Parameters Estimation parameters of structural equation modeling with partial least square approach was obtained through a three-stage process of iteration and at every stage of producing estimates. The first phase resulted in estimated weight \( w_{jh} \). Weight estimation of \( w_{jh} \) weights obtained through two ways, namely mode A and mode B. Mode A is designed to obtain the estimated weight of the types of indicators reflexive, whereas the B mode is designed to obtain the estimated weight of the types of indicators formative.

In mode A weights \( w_{jh} \) the regression coefficient of \( Z_j \) on inner estimation \( X_j \), \( X_{jh} = w_{jh} Z_j + \varepsilon_{jh} \). Estimates for the model is obtained through OLS in a way to minimize the sum of squares \( e^2_{jh} \), as follows:\( e_{jh} = X_{jh} - w_{jh} Z_j \), \( \sum_{h=1}^{l} e_{jh}^2 = \sum_{h=1}^{l} \{ X_{jh} - w_{jh} Z_j \}^2 \). Then the sum of the squares \( e_{jh} \) lowered to the face \( w_{jh} \) in order to obtain weights for mode A: \( \hat{w}_{jh} = \frac{\text{Cov}(X_{jh}, Z_j)}{\text{Var}(X_j)} \). Mode 2 of the weighting vectors \( w_{jh} \) of \( w_{jh} \) is the regression coefficient vector of \( Z_j \) simple regression models \( X_{jh} \) on inner estimation \( Z_j \).

\[ X_{jh} = w_{jh} Z_j + \varepsilon_{jh} \]  

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By following the PLS algorithm of Wold (1985) and which has been improved by Lohmoller’s (1989), the estimated inner \( Z_j \) modelsosstandarized latent variables \( (\xi - m_j) \) is defined by \( Z_j \). \( Z_j \) connected to \( \xi_j \) \( e_{j1} \) Y_1 \. Whereinthe weightinnere_j, modelscan be selected via three schemes, namely:

- Inner Model Estimation

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- Path scheme

Latent variables connected to \( \xi_j \) are divided into two groups, namely: the latent variables that explain \( \xi_j \) and is followed by the variables described by \( \xi_j \). If \( \xi_j \) is described by \( \xi_j \), the path is the multiple regression coefficient between \( Y_i \) and \( \theta \).

\[ e_{ji} = \begin{cases} \text{multiple regression coefficient of } Y_i \text{ from } Y_j, \text{if } \xi_j \text{ described by } \xi_i \\ \text{Cor}(Y_i, Y_j), \text{if } \xi_j \text{ described by } \xi_i \end{cases} \]
6. Finding and Discussion

Recorded the realization of ship traffic during the first quarter from January to March 2016 in Pelindo IV Makassar Branch of 1,408 calls or equivalent to 7,343,565 Gross Tonnage (GT) with absorption rate of 26.88 percent. The realization of ship visit which was managed by Pelindo IV Makassar Branch in the first quarter increased compared to the same period in 2015. In the first quarter of 2015 the number of ship visits in PT.Pelindo Makassar reached 1,289 calls or equivalent to 6,555,894 GT up to 1,408 calls or equivalent to 7,343,565 GT. While the number of foreign ship visits (foreign-flagged) only recorded at 53 calls or equivalent to 756,038.

Viewed from ship types, the increase also occurred in the flow of freight vessels during January to March 2016 through the port of Makassar as many as 755 calls or equivalent to 1,917,571 GT, compared to the same period in 2015 which only reached 334 GT. The number of foreign ship visits (foreign-flagged) only recorded at 53 calls or equivalent to 756,038. The increase also occurred in the type of container vessel, i.e during January until March 2016 amounted to 377 calls or equivalent to 1,917,571 GT, compared to the same period in 2015 which only reached 334 calls or equivalent 2,355,269 GT[11]. Based on the following table we can make the following observations:

| Parameter Constant | b_j | is multiple regression coefficient of Y_j endogenous latent variables were standardized in the explanatory latent variables (exogenous) Y_i, Y_j = \sum_{l=1}^{I} b_j Y_l + e_j. | At the time of converging latent variables (non-centered) \hat{\xi}_j is equal to Y_j + \hat{\mu}_j, the regression equation when the latent variable \hat{\xi}_j not converge is: \hat{\xi}_j = b_{j0} + \sum_{l=1}^{I} b_j \hat{\xi}_l + e_j.e_j^2 = (\hat{\xi}_j - (b_{j0} + \sum_{l=1}^{I} b_j \hat{\xi}_l))^2 = \hat{\xi}_j^2 - 2\hat{\xi}_j b_{j0} - 2\hat{\xi}_j \sum_{l=1}^{I} b_j \hat{\xi}_l + (b_{j0}^2 + 2b_{j0} \sum_{l=1}^{I} b_j \hat{\xi}_l + \sum_{l=1}^{I} b_j^2 \hat{\xi}_l^2). \frac{\partial e_j^2}{\partial b_{j0}} = b_{j0} = \hat{\xi}_j - \sum_{l=1}^{I} b_j \hat{\xi}_l with b_{j0} = \hat{\mu}_j - \sum_{l=1}^{I} b_j \hat{\mu}_l. So the location parameter is a constant b_{j0} for endogenous latent variables and the average \hat{\mu}_j for exogenous latent variables.

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a. The number of observations for each variable was 30 persons involved in port handling, which reflect that the respondents have answered all questions concerning study variables.

b. The average value for Enterprise Resource Planning and improvement, Transactional due diligence and merger integration was 86.4%, indicating that the respondents believe that Enterprise Resource Planning and improvement, Transactional due diligence and merger integration in the port handling is relatively high.

c. The average value of the independent variables ranged from 72% to 82%, which means that the respondents assume that Enterprise Resource Planning and improvement, Transactional due diligence and merger integration is highly affected by those variables.

d. Standard deviation for all variables was relatively low, which indicate that the respondents’ answers are consistent and close to each other [12]

The following sections shed some lights on the concept of each statistical procedure used in the research. Results of testing that the whole independent variables showing positively associated with the likelihood of reducing cost. The value of loading (λ) to be valid if it has a latent variables to be measured ≥ 1.96, that way in Table 3, the whole indicators apparently valid to be continue as good indicator to support latent variable. Enterprise resource planning and improvement, transactional due diligence and merger integration more influence the reduction cost in sea freight cost, as well as reducing inventory cost

**Determinants model (R Square)**

The estimated coefficients for reduction cost is 60.6 percent. We attribute the prominent of significance in statistical model.

### Table .2 Model Summary

| R | R^2 | Adje R^2 | DW | F  | Sig. |
|---|-----|----------|----|----|-----|
| 0.779 | 0.606 | 0.399 | 1.709 | 2.925 | 0.021 |

Source: Output of Test of Bootstraping SPSS

In Table 2. Results of the autocorrelation test shows Durbin-Watson value of 1.709 which means that data is processed free from autocorrelation. In Table 2, to detect whether there is multicollinearity between independent variables can be seen VIF value in colinearity statistic as illustrated in table 5.13 above which shows VIF value exceeds tolerance value, meaning no multicollinearity.

### Table .3 Analysis of Variance

| Variables | C.R | B | SE | Beta | t | Sig. | Tolerance | VIF |
|-----------|-----|---|----|------|---|-----|-----------|-----|
| ERP       | .829 | 7.514 | 0.829 | 0.248 | 0.876 | 3.348 | 0.003 | 0.303 | 3.300 |
| Cons      | -.639 | -6.481 | -.639 | 0.313 | -0.755 | -2.043 | 0.055 | 0.152 | 6.596 |
| Line Proc | .020 | .281 | 0.020 | 0.141 | 0.033 | 0.141 | 0.890 | 0.381 | 2.625 |
| Unit Cost | -.204 | -.1973 | -.204 | 0.456 | -0.230 | -0.447 | 0.660 | 0.078 | 12.747 |
| Red Invent | .794 | 7.739 | 0.794 | 0.437 | 0.902 | 1.818 | 0.085 | 0.084 | 11.877 |
| Dist Cent | .121 | 1.449 | 0.121 | 0.207 | 0.169 | 0.585 | 0.565 | 0.249 | 4.019 |
| Supp Loc  | -.064 | -.846 | -.064 | 0.118 | -0.099 | -0.544 | 0.593 | 0.630 | 1.587 |
| Sing Source | .293 | 3.326 | 0.293 | 0.187 | 0.388 | 1.561 | 0.135 | 0.336 | 2.974 |
| Sept Cost | .001 | .006 | 0.001 | 0.345 | 0.001 | 0.002 | 0.998 | 0.200 | 4.996 |
| Integ SellInvent | -.308 | -2.468 | -0.308 | 0.374 | -0.288 | -0.825 | 0.420 | 0.170 | 5.865 |

Source: Output of Test of Bootstraping Smart PLS
7. Hypotheses Tests

Based on Table 3, results of testing hypothesis, that enterprise resource planning and improvement, transactional due diligence and merger integration, positively affect and not associated with cost reduction with estimated path coefficient 0.829, and C.R value is 7.514. Variable of reducing inventory cost affect and associated with reducing cost with estimated path coefficient 0.794, and C.R value is 7.739.

8. Findings

Our finding is that the wider the scope of the reduction cost will be an effort to develop the enterprise resource planning and improvement, transactional due diligence and merger integration, positively affect and not associated with cost reduction with estimated path by arranging online system before ship bank, embark and disembark. Moreover, the using virtual money more effectively in port field, avoid physical money in transaction, or avoid extra payment, regarding to illegal payment. Variable of reducing inventory cost affect and associated with reducing cost of storage, cost of maintenance, and cost of order through just in time applied system. Refer to Yoshitsugu Kanemoto [7] that, transportation relate to distribution and consumption of society. That way the government should prioritize the importance of transportation as one of the drivers of the economy, and lowering cost of consumption goods.

9. Conclusions

If one of your goals is to reduce freight spend, and hope that applying competitive pressure to carriers will encourage them to reduce port rates, and you may want to think again and looking for another determinant factors, such as information system, system and procedure, management system, and inventory management. Every year is a good idea as you will be able to align your needs with the carriers that find it most attractive at that point in time management. However, this presumes some carrier flexibility. Start by challenging organizational beliefs about different carriers with data and facts about performance. After all, it may be necessary to change carriers to save money.

Regional carriers typically offer a lower price point, with transit times often equal to or faster than national carriers. Using a national carrier for regional shipments typically leaves money on the table. You should have taking advantage of the fact that carriers tend to have some geographical pockets that are more competitive than others.

Many shippers, however, do not have such technology, so use a routing guide, which tells them the carrier to use based on shipment origin and destination. In order to generate that routing guide, a comparison between carriers needs to be conducted that takes into account about pricing factors of tariff discounts, minimum charges, fuel surcharges, and transit times.

A robust comparison requires a deep dive into historical data of amount of practice importer, about their experience in port and inventory handling to reduce freight spends. Many shippers’ routing guides only account for tariff discounts, and do not take into account the fact that often the best-priced carrier does not have the best discount. Judging the true low-cost option is only possible when you have a solid handle on your shipping patterns.

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