**Domestic Container Shipping Market Profile:**

 **A Case Study of Indonesia**

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**Abstract**. As the largest archipelagic country globally, the shipping industry has played important roles in supporting Indonesia's economy. However, the Indonesian Ship Owners Association (INSA) stated that Indonesia's commercial shipping was experiencing an oversupply. This research was conducted to determine the equilibrium between Indonesia's container shipping market's supply and demand. The analysis was carried out on nine major container shipping liner routes in Indonesia. The methods used include regression analysis, relational analysis, supply and demand curve analysis, market equilibrium analysis, market structure analysis, and voyage calculation analysis. The research data input is based on Ship Arrival and Departure Report Data (LK3) and the generic data from simulation results with business actors. The results show that the demand curve for containers is inelastic with a value of 0.31, which indicates that the cargo-owners have no choice but to deliver the goods at a freight rate determined by the shipping company. Meanwhile, the supply capacity curve is elastic with a value of 3.16, which indicates that the shipping company can adjust the capacity of the supply quantity. For example, the demand curve on the Surabaya-Makassar route and the supply curve has an equilibrium point at a quantity of 99 million TEUs.Nm and a price of IDR 2.16 million / TEUs. Another example, as for the Jakarta-Surabaya route, the demand curve does not intersect the supply curve due to an over-supply meaning too many ships available in this route. In order to correct the market failure, the supply curve should shift to the left to find its equilibrium by reducing the supply capacity by 258 thousand TEUs.

# Introduction

Indonesia is the largest archipelagic country in the world, with more than 17,000 islands, in which 6000 islands are inhabitant. Indonesia has built more than 1500 ports to provide distribution access, where 120 of them are run by state-owned enterprise and equipped with Container Handling Terminal. With the increasing number of container throughput at the port from 7,2 million in 2009 to 14,7 million in 2019, the rate of containerization is still expected to continue in the future. The trend also depicted the importance of the container shipping industry in Indonesia. At present, there are more than 860 liner routes for container shipping provided by more than 50 companies across Indonesia.

Indonesia has a merchant fleet of 24,046 vessels with a capacity of 38.5 million GT. However, this number cannot yet be identified for each type of ship, especially for container ships. Furthermore, INSA (Indonesian Ship Owner Association) said that Indonesia's commercial shipping was experiencing an oversupply (Yasinta, 2015). This is the challenge in this area is how to measure the supply side of container shipping market in some commercial routes in Indonesia, and yet, this is a gap to understand the market behaviour. Therefore, further research is needed on the domestic shipping industry's condition to determine the conditions of demand and supply of domestic container shipping.

This paper extends the supply and demand analysis on the domestic container shipping industry. It is mainly focusing on three problems. Problem 1 is how to measure the demand curve in domestic container shipping, whether the demand side is elastic or inelastic towards the market trend. After analyzing the demand side, the same analysis applied to the supply side. Therefore, problem 2 is a domestic container shipping's market structure, including how the supply capacity responds to market trends. Problem 3 is about combining the demand and supply side into the dynamic of the supply & demand curve. Thus, the objective of this research is to study the market behaviour by measuring market elasticity.

# Review of the Literature

* 1. Demand of Container Shipping Industry

Many academia stated that the demand for marine transportation services is derived from economic activities. It can be captured through cargo production in and out of ports (Stopford, 2009). Various research used regression method to calculate the demand for the container shipping industry. There are many combinations of the variable used, but Stopford (2009) extending the analysis of the causal variables within 4 categories: (i) macroeconomic condition, (ii) cargo commodity type, (iii) random shock, and (iv) the new emerging technology.

The demand analysis of the container shipping industry often used to forecast the trend. Esmer (2015) used a multiple regression method to forecast the cargo demand of ports in Turkey. He measures the Gross Domestic Product (GDP), foreign trade, and population within the previous 5 years as independent variables then regress them to forecast ports throughput to up to 9 years. Chou (2007) modified the regression model of two variables, GDP and port throughput, by adding a non-stationary contribution coefficient to deal with the forecast error problem.

Although there were many varieties of variables used in the demand analysis, the most common way is to derive the demand for cargo from economic output or GDP. Therefore, in this paper, the authors use the GDP only as an independent variable in the regression analysis.

The importance of demand analysis of shipping is not only for shipping industries itself (both liner and tramper market), but it is also for shipbuilding industries. This is due to the logical consequences that shipping industry demand will trigger the demand for shipbuilding industry. For example, (Han SW, *et.al*, 2024) has demonstrated that in LNGC transportation, by using system dynamics model, forecasting of shipbuilding demand can be derived from shipping market.

* 1. Market Structure of the Shipping Industry

 Market structure is a concept that describes the elements and the situation of a market. Uzonwanne et al. (2017) stated the most common three elements of the market: (i) the size distribution of sellers/buyers, (ii) the degree of product differentiation, and (iii) the condition of entry into the market. Various research have been down to measure market structure, mostly by calculating the Concentration Ratio of the big four players (CR4) ratio or Hirschman-Herfindahl Index (HHI). Lijesen et al. (2002) conducted HHI analysis on the aviation industry, Alegria et al. (2008) on the banking industry, and Noam (2008) on the internet and media industry.

 While in the shipping industry, Sys (2016) calculated the HHI and CR4 ratio on the global liner industry before and after the consolidation process from 1995 to 2008. He concluded that the market was become more concentrated within the period. Thus, the hypothesis of an oligopoly market in the shipping industry is confirmed to be positive. Charłampowicz (2018) questioning whether the global container shipping market was still competitive for its participants. He also uses the CR4 ratio and HHI as a parameter of measurement, which directed to the same result as Sys (2009). Still using the same method, Goulielmos (2017) found that the increase in the sample used to analyze will lower the value of HHI.

 Based on previous research, there is a similarity in its conclusion that the container shipping industry's market structure is an oligopoly market, with some companies control the majority of the share in the market.

* 1. Dynamics of Supply and Demand Curves in Container Shipping

The economist tried to explain market condition using demand and supply curves visually. The curve consists of price as the y-axis and quantity as the x-axis. That basic curve could explain how the market interacts when there is a shortage or oversupply in the market. H.L. Moore firstly introduce the demand curve by deriving the curve from statistical data around 1915. The demand curve is characterized by the line from the upper left downs to the right, while the supply curve was the opposite.

On the shipping industry, Stopford (2009) explained the special characteristic of the shipping industry's supply curve. He carefully analyzed the supply curve of an individual ship and the shipping industry as a whole and concluded that the supply curve for an individual ship is a J-shape curve. That individual curve then stacked and combined with another J-shape individual curve to form the shipping industry's supply curve. Therefore, the shipping industry's curve is an aggregate of individual ship curve and has a flatter shape than the usual supply curve. On the other hand, the main characteristic of the shipping industry's demand curve is a steep line due to inelasticity towards the supply side.

Efes et al. (2019) proposed a supply-demand interaction model in China's shipping industry. The higher the demand will lead to a higher freight rate (price), while the increase in supply will lower the freight. In the short run, the supply side cannot adjust quickly in response to the market. While in the long run, the supply side shift slowly adjusts the market's increase and lower the freight. Luo et al. (2009) use the cobweb model to analyze the interaction between supply and demand in the container shipping industry. At the time when the freight is high, the quantity demanded is lower than the quantity supplied. The oversupply will reduce the price. At the new lower-price level, the quantity demanded become higher than the quantity supplied. This excessive demand will lead to an increase in freight. The interaction cycle then continues from the beginning.

# Methodology

The analysis was carried out in 3 stages of analysis demand-side analysis, supply-side analysis, market equilibrium analysis. The first step is the demand side analysis. This stage aims to determine the condition of the demand for domestic container shipping. The analysis was carried out by regressing the components in the Gross Regional Domestic Product (GRDP) with data on domestic container production at the port. As for the projection process on the demand side, the growth of Indonesia's GRDP published by the World Bank is used and then regressed with container production in Indonesia. Thus, as explained in the literature review, the author used the regression model as follows:

|  |  |
| --- | --- |
| $$Throughput=Demand=c\_{0}×GDRP$$ | (3.1) |

Where c0 is the coefficient that connects the demand for sea transportation services with GRDP.

Furthermore, the demand curve analysis is carried out with the input of container demand data from LK3 and processed data from interviews with business actors (cargo owner). During the interview, a simulation was conducted on the effect of freight rate changes on the number of goods to be shipped. The results of the interview are structured to form a demand curve for the domestic container shipping industry. Thus, the quantity component is the amount of container demand, while the price component is the expected price from interviews with business actors. To determine the elasticity of the demand side, elasticity analysis was performed using the mid-point elasticity method.

|  |  |
| --- | --- |
| $$Elasticity=\frac{\frac{Q\_{2}-Q\_{1}}{\frac{(Q\_{2}+Q\_{1})}{2}}}{\frac{P\_{2}-P\_{1}}{\frac{(P\_{2}+P\_{1})}{2}}}$$ | (3.2) |

Where $Q\_{2} and Q\_{1}$ are quantity demanded at the Price (freight) of $P\_{2} and P\_{1}$ respectively.

On the supply side, the analysis starts with identifying the market structure. The analysis uses the HHI value on the 9 routes analyzed.

|  |  |
| --- | --- |
| $$HHI= \sum\_{i=1}^{n}s\_{i}^{2}$$ | (3.3) |

Where *Si* indicates the market share of each company identified. The market structure is identified to validate the simulated domestic container shipping demand curve data from the interview results.

Next, an analysis was carried out using a generic voyage calculation model to determine the size of the capacity of Indonesia's container ships fleet, both in Twenty Equivalent Unit (TEUs) and TEUs.miles. The model can also be used to determine the unit cost on the supply side. The unit cost will be used as a benchmark for market conditions to determine the shipowner's profitability in operating his ship and prove the relationship between the supply capacity variable and the unit cost. The voyage calculation model was prepared by considering ship age, ship size, ship speed and fuel consumption, crews, and others as follows:

|  |  |
| --- | --- |
| $$Total Cost=CapitalC+OperatingC+VoyageC+CHC$$ | (3.4) |
| $$Unit Cost (TEUs)= \frac{Total Cost}{Ship Capacity ×Freq }$$ | (3.5) |
| $$Unit Cost (TEUs.Miles)= \frac{Total Cost}{Ship Capacity ×Freq x Distance}$$ | (3.6) |
| $$Capacity \left(TEUs\right)=Ship Population ×Ship Capacity $$ | (3.7) |
| $$Capacity \left(TEUs.Miles\right)=Ship Population ×Ship Capacity ×distance$$ | (3.8) |

Where:

|  |  |  |
| --- | --- | --- |
| **Variable name** | **Explanation** | **Unit** |
| $$Total Cost$$ | Total Shipping Cost per annum | IDR |
| $$CapitalC$$ | Capital Cost per annum | IDR |
| $$OperatingC$$ | Fixed Operating Cost per annum | IDR |
| $$VoyageC$$ | Voyage Cost per annum | IDR |
| $$CHC$$ | Container Handling Charges per annum | IDR |
| $$Unit Cost (TEUs)$$ | Unit cost per Container | IDR/TEU |
| $$Ship Capacity$$ | Container Ship Capacity | TEU’s |
| $$Freq$$ | Frequency of service (Ship’s call) per annum |  |
| $$Distance$$ | Total distance travelled per route | N.miles |
| $$Ship Population$$ | Number of container ships operating in a particular route | Unit of Ships |

To complete the voyage analysis on the calculation of the domestic container ships fleet, a sensitivity analysis of the unit cost was carried out against the load factor and fuel price. Both variables are variables that greatly influence the freight rate fluctuation. Then the supply curve analysis is carried out. The quantity component is the container fleet's capacity, while the price component represents the prevailing freight rate. Freight rates are obtained by conducting interviews and collecting primary and secondary data. An elasticity analysis using the mid-point elasticity method is also carried out (equation 3.3).

The next stage is market equilibrium analysis which is based on short-run conditions. The input at this stage is the calculation output generated in the previous stage, both from the demand and supply side. The combination of the two is carried out and analyzed to determine the domestic container shipping industry's equilibrium. The market has its equilibrium only if there is an intersection point between the demand and supply curves. If there is no intersection point (equilibrium point), then the market is said to be unbalanced. An unbalanced market means that the market is experiencing an oversupply (when the demand curve is above the supply curve) or shortage (when the supply curve is above the demand curve). Based on the literature study in sub-chapter 2.4, the supply curve will shift horizontally so that there is a meeting point (equilibrium point) to the demand curve so that there is a balance. So that if there is an imbalance in the market, the supply side will adjust the imbalance.

The analysis is carried out mathematically using the parabolic equation method. The x-axis is the quantity variable, while the y-axis is the shipping rate variable. The demand curve is arranged into a demand function (*D*) with a quadratic equation as follows:

|  |  |
| --- | --- |
| $D = f(x)= $*ax2 + bx + c*  | (3.9) |

Where *a, b, c* are parameters of demand function to be determined.

Then the supply curve is also arranged into a supply function (*S*) with the quadratic equation as follows:

|  |  |
| --- | --- |
| $S =f(x)= i$*x2 + jx + k*  | (3.10) |

Where *i, j, k* are parameters of supply function to be determined

Furthermore, by using the quadratic non-linear equation method, the *x* roots of the demand and supply function equation are obtained as follows:

|  |  |
| --- | --- |
| $$\left(a-i\right)x^{2}+\left(b-j\right)x+c-k= 0$$ | (3.11) |
| $x\_{1}and x\_{2}= \frac{-\left(b-j\right)\pm \sqrt{(b-j)^{2}-4((a-i)(c-k)}}{2(a-i)}$ | (3.12) |

The *x* root of the function above is the intersection between the demand and supply curves. In addition, by substituting the non-negative *x* root into the demand or supply function, the y-axis (price) of the equation can be found. Suppose the two equations do not have the same root, where $(b-j)^{2}-4(\left(a-i\right)\left(c-k\right)< $0, the supply curve will shift horizontally to the left. The shift in the supply function f (s) is determined by adding the constant z, which is the value of the quantity supply to be reduced which is obtained by calculating the load factor ratio on other routes where there is an equilibrium.

# Results

## The Demand Side Analysis

#### The Relation between Economic and the Demand

This section analyses the relationship between economic conditions and the demand for sea transport services—the analysis used to test the influence of economic variables on the growth of containers in domestic shipping. The GRDP variable represents economic variables in this analysis. The routes chosen was the nine busiest of all liner routes and they are considered as the full market mechanism where the container freight in those routes is determined by the demand–supply mechanism. These routes are depicted in the map below:



Figure 1 Route Map of Domestic Container Shipping

The analysis was carried out by combining the GRDP variables of the two regions on each shipping route and then connected with the amount of loading flow on each of the analysed routes. The combination of two GRDP from each origin and destination area is due to the cargo carried on that route, which is basically loading and unloading cargoes. The merger of loading and unloading is accompanied by a combination of GRDP of the origin and destination regions. The following is the results:

**Table 1 Relation Between Economic and Shipping Demand**

|  |  |  |  |
| --- | --- | --- | --- |
| **Route** | **RSQ** | **CORREL** | **Equation** |
| **Slope** | **Intercept** |
| JKT-BLW | 0,89 | 0,94 | 0,05819 | 204206 |
| JKT-SBY | 0,92 | 0,96 | 0,07189 | 55787 |
| JKT-PNK | 0,87 | 0,93 | 0,05598 | 94997 |
| SBY-BNJRM | 0,97 | 0,99 | 0,13257 | -65057 |
| SBY-MKS | 0,90 | 0,95 | 0,01891 | 379607 |
| SBY-SMRND | 0,93 | 0,97 | 0,06558 | -6883 |
| MKS-JKT | 0,97 | 0,99 | 0,01886 | 124129 |
| MKS-AMB | 0,89 | 0,94 | 0,05090 | 16340 |
| MKS-BIT | 0,92 | 0,96 | 0,03996 | 10589 |

The analysis results show that the coefficient of determination (RSQ) is 0.87 to 0.97 on the analysed routes. This value indicates that the PDRB variable influences 87% to 97% on the container load variable.

#### Demand Curve

The demand curve is a curve used to determine how the graph forms between the number of goods needed in the market (quantity) and the expected price (price). To determine this curve in the domestic container shipping industry, the Q value is represented by the volume of container demand on each route, multiplied by each route's distance. The value of price determined by interviewing the shipper association then converted into a demand curve based on reality in the field. Thus, the following results were obtained

Figure 2 Demand Curve of Domestic Container Shipping

The curve above shows the shipping demand curve and how it moves against the prevailing shipping rates. The demand curve consists only of two routes, the Jakarta-Surabaya route and the Surabaya Makassar route. Furthermore, an analysis of elasticity on the demand curve is carried out to determine the market characteristics of the domestic container shipping industry's demand. This analysis was performed using the midpoint elasticity method. This method was chosen because it can measure the value of elasticity between two points in a certain period. The two points used are the lowest and highest points on the demand curve in Figure 5.

Based on the calculation, it is known that the elasticity value of the demand side of the domestic container shipping industry is 0.31. This value indicates that the *demand side is inelastic to price changes* (Elasticity <1). The goods owner has no other choice when ocean freight is increased by the shipping company other than sending at the rate set by the shipping company. This forces the goods' owner to send his goods at the rates imposed by the shipping company. The demand curve's elasticity is not completely inelastic because there is still a slight change in the quantity when the tariff is increased. If the tariff is too expensive, it could be not feasible for the end-users to purchase the goods.

This finding is inline with the results of other studies that in shipping markets, transport demand is known to be highly inelastic with respect to freight rates. Beenstock and Vergottis (1989), Wada et.al. (2018), Bai et.al. (2022) considered demand to be perfectly inelastic to freight rates.

## The Supply Side Analysis

#### Market Structure Analysis

This analysis uses the Herfindahl-Hirschman Index (HHI) calculation method. This index is used to measure market concentration and conduct evaluations. HHI is obtained by squaring each company's market share and then adding up the results of all these squared numbers. In 2019, the conditions for the domestic container shipping market were as follows;

Figure 2 HHI Score a Whole Shipping Industri

The authors first review on a national scale and found that the domestic container shipping industry is classified as an industry with moderate concentration (HHI <2,500) in 2019. The four largest companies controlled 86.2% market share, with an index of HHI 2108. Meanwhile, the top 10 and top 20 largest companies controlled 95.4% of the market and 98.5% of the domestic container market with HHI 1957 and 1939.

As for the time series analysis from 2017 to 2019, there is an upward trend in the value of HHI. It indicates that the market conditions are increasingly concentrated (from 1,297 to 1,937) within the period given. It can be seen that the 4 largest companies have a positive trend in dominating the market (from 67.7% to 86.24%) in a given period. On the other hand, other than the top 4, they are experiencing a decrease in the value of HHI, which shows that apart from the 4 largest companies, the company is getting weaker in controlling the market and thereby increasing market competition in the non-4 largest market segments.

Figure 3 HHI Score for Every Route

After reviewing the HHI as a whole nation, the authors compared to HHI score for some liner routes. Based on the above figure, it is known that none is categorized in the competitive zone among the largest routes for domestic containers. Considering that all HHI index values are above 1500, which indicates the higher market concentration. The high number of players is not an indicator of a competitive market. To prove this, it can be seen on the Jakarta-Surabaya route with an HHI value of 3692. On the Jakarta-Surabaya route, there are 10 companies. In the Jakarta-Surabaya route, even though the number of companies is large, 80% of the market is controlled by one particular company.

The different results of HHI as a whole industry and HHI in smaller views per-route indicates that the four large companies dominating the market actually do not compete directly on certain routes. The large companies tend not to have market shares that overlap each other within the same routes they operated. Under these conditions, the analysis of HHI per-route will give high results (concentrated market and weak competition) that HHI as a whole industry. Similarly, if the analysis was conducted on the aggregate level nationally, the value of HHI is much lower (1,558).

Moreover, a high HHI value cannot always be interpreted negatively. The routes on the right side of the graph, for example, are basically non-commercial routes. These routes are operated on the principle of transport to promote the trade. Therefore, a high HHI on this route indicates that there is no market competition. The state generally subsidizes ships that operate in these routes.

#### The Flexibility of Supply Side in the Liner Shipping Industry

Based on data processing of Ship Arrival and Departure Reports at Ports in Indonesia for the 2017-2019 period, the capacity of ships sailing on domestic routes is obtained, and the following are the result;

Figure 4. Relation between Capacity- Call and Relation between Ship Number-Ship Call

Based on Figure 4, it is known that domestic container shipping companies serving domestic routes have relatively the same dimensions in each period. However, if further analysis between the call ships and the number of ships serving the route in the same period shows the opposite result. It is also known that there is no relationship between the number of ships and the call ships. Further analysis of the determining factor of both showed a value of 0.03. This means that vessels operated on domestic container shipping routes have a high degree of flexibility and can be changed at any time to another route. In other words, ships that operated in domestic liner routes are not fixed. Shipping companies can substitute, reduce, or add ships to respond to the dynamic market conditions.

#### Supply Curve

To create a chart of offers consisting of the price (price) and quantity (number of services offered), determined based on freight and the number of container shipments from each port under review. The amount of Q value used is determined from the value of containers sent during the first semester of 2019 and the second semester of 2019. The P-value or freight rate is determined based on interviews with container shipping business actors, forwarder companies, or information from goods owners who are accustomed to using Sea container shipping services.

Figure 5 Supply Curve of Domestic Container Shipping

Based on Figure 5, the shape of the domestic container shipping industry's supply curve is flat at first lower left and then climbs steeply upwards. This is also explained by Stopford, 1997 that basically, the supply curve is the aggregate form of the supply curve for each ship with a J-shape. The higher the price as the quantity increases is explained due to the limitations on the ship's dimensions. Therefore, when the quantity increases, at a certain point, it will require business actors to invest in acquiring new vessels so that the price will also rise higher. The authors use a logarithmic scale to avoid numerical error between the two variables.

Furthermore, an analysis of elasticity on the demand curve is carried out to determine the market characteristics of the domestic container shipping industry's demand. This analysis was performed using the midpoint method. This method was chosen because it can measure the value of elasticity between two points in a certain period. The two points used are the lowest and highest points on the demand curve in Figure 5.

The elasticity of the supply side of the domestic container shipping industry is 3.16. The elastic condition means that the shipping company can adjust its quantity (increase or decrease) in response to market conditions. This value indicates that the supply side is elastic related to price changes. This elasticity is supported by the previous sub-chapters analysis results, which explains that the vessel capacity's market characteristics are dynamic in nature. Ships from one route can be moved to another route to respond quickly to the market. Therefore, the capacity from the supply side can quickly adjust to the latest market conditions.

## Market Equilibrium in Domestic Container Shipping

After obtaining the demand curve and supply curve in the domestic container shipping industry, as shown in Figure 5 and Figure 12, the two curves are combined to see how the two curves interact. The results are as follows:

Figure 6 Market Equilibrium

Based on the interaction graph in Figure 8, it is known that there is an intersection point between the demand curve and the supply curve on the Surabaya-Makassar route, while on Jakarta-Surabaya route shows the opposite. The equation of the supply curve and the demand curve were then analyzed to find the join equation's roots. The two-equation will intersect at 7.99 and 6.33. As the graph was on a logarithmic scale, they need to convert to the real scale. By using the power formula, it can be seen that the two graphs intersect at a quantity of 99,764,654 TEUs.Nm, and a price of Rp. 2.16 million. A point of intersection between the demand and supply curves indicates that the market has its equilibrium and in good condition.

On the other hand, the demand curve does not intersect the supply curve at the Jakarta-Surabaya route. The demand curve on the Jakarta-Surabaya route floats above the supply curve. Although the graph was not common in practice and theories, the demand above supply curve condition indicates that the market on the Jakarta-Surabaya route is experiencing a capacity surplus. According to the explanation of the demand side characteristic, it is known that the demand side has control over the quantity, while the supply side has control over the price. The demand side will adjust the freight at any price given by the supply side, while the supply side will adjust the capacity at quantity given by the demand side. Therefore, when the demand and supply side does not intersect caused by the lack of quantity demanded, the market mechanism should be to reduce the ship's capacity so that it will move the supply curve moves horizontally to the left to find its equilibrium.

Figure 7 Movement of Supply Curve

Based on Figure 7, the supply curve shifts horizontally to the left to intercept the demand curve on the Jakarta-Surabaya route at points 7.78 and 6.35. The intersection point is calculated by finding the roots of a joined equation between supply and demand equation. As the number is on a logarithmic scale, it equivalent to the quantity of (Milion TEUs.Nm) 61,535 and a price of (Rp/TEUs) 2,262,945. The curve shift is a representation of the reduction in the supply quantity of 100 million TEUs.Nm, or the equivalent of 258 thousand TEUs per year due to a surplus. The initial capacity when the surplus was 186 million TEUs.Nm, or 481 thousand TEUs per year. This shift increases the average load factor on the Jakarta-Surabaya route from 0.31 to 0.71. Currently, the route consists of 59 container ships managed by 10 shipping companies. The total capacity of the 59 vessels is 22,183 TEUs. Based on LK3 data for the ports of Tanjung Priok and Tanjung Perak, it is known that the total productivity of the 59 ships reached 788,123 TEUs / year. However, the average load factor was only around 0.2.

# Conclusions

Our comprehensive analysis of the domestic container shipping industry in Indonesia reveals a fascinating interplay of supply and demand, each with distinct characteristics shaping market dynamics.

On the demand side, the market exhibits a notable inelasticity, with a calculated value of 0.31. This isn't just a number; it paints a clear picture: cargo owners, faced with limited viable alternatives for shipping their goods, largely accept the rates set by shipping companies. In essence, they're in a position where they don't have much leverage to push back on pricing, reflecting a captive audience for these essential services.

Turning to the supply side, the market structure is distinctly oligopolistic, as evidenced by Herfindahl-Hirschman Index (HHI) scores ranging from 1833 to 10000, indicating a medium to high concentration. Interestingly, the top four domestic container shipping companies have strategically segmented the market, operating on different routes without significant overlap. This suggests a pre-existing division of territory, preventing direct competition on every single path. Crucially, the supply side demonstrates significant elasticity, with a value of 3.16. This means shipowners have considerable flexibility to adjust their vessel capacity and operations in response to evolving market conditions, allowing them to scale up or down as demand fluctuates.

Analyzing the market equilibrium provides critical insights into the industry's balance points. In the dynamic interplay between supply and demand, it appears that the demand side primarily dictates the quantity of goods shipped, while the supply side holds sway over pricing. A clear equilibrium point was identified on the vital Surabaya-Makassar route, settling at 99.7 million TEUs (Twenty-foot Equivalent Units) and a price of Rp 2.16 million. This indicates a healthy balance where the volume of goods matches the available shipping capacity at a mutually agreeable price.

However, the picture isn't uniform across all routes. The Jakarta-Surabaya route, another key artery, currently experiences oversupply, meaning there's more shipping capacity than immediate demand. This disequilibrium prevents an intersection point between the supply and demand curves. To bring this market into balance, a substantial adjustment is required: the supply curve would need to shift horizontally to the left, effectively reducing the available shipping capacity by 258 thousand TEUs per year. This highlights a need for strategic capacity management to align supply with actual demand on this specific route.

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