Container freight rates and the shaping of global economic space

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Abstract

The objective of this paper is to explore how container freight rates vary globally and regionally and over time. This is achieved in part by considering freight rates as a measure of economic distance. Unlike absolute distance which is invariant between locations, economic distance is a relative measure, but like absolute distance it can be mapped. In this paper the geographical distribution for a set of rates from markets around the world to the ports of the Northern Range of Europe is mapped. This cartographic representation provides a unique opportunity to explore the spatial arrangement of markets while providing a number of insights into the spatial structure of rates during a period of considerable change. The paper goes on discuss this spatial structure in the context of three issues that have been raised in the literature: the relationships between rates and physical distance; the role of market conditions and rates; and, the relationships between rates and economic development. From this examination, questions are raised involving long held assumptions about distance and rates, competition and pricing, and rates and economic development.
Introduction and objective of paper

The objective is to explore how container freight rates vary globally and regionally and over time. These freight rates can be mapped and we consider they represent a measure of economic distance. The economic distances mapped vary according to the fluctuations of freight rates that can vary significantly over time, as exemplified by the data set used here are high like shown by the data collected for three years.

In this paper the geographical distribution for a set of rates from markets around the world to the ports of the Northern Range of Europe is mapped. This cartographic representation provides a unique opportunity to explore the spatial arrangement of markets while providing a number of insights into the spatial structure of rates during a period of considerable change. The paper goes on to discuss this spatial structure in the context of three issues that have been raised in the literature: the relationships between rates and physical distance; the role of market conditions and rates; and, the relationships between rates and economic development. From this examination, questions are raised involving long held assumptions about distance and rates, competition and pricing, and rates and economic development.

Container Freight Rates

In practice container rates are quoted by the carriers as the price per box, with the rate, Freight All Kinds (FAK), not being theoretically based on what is in the container. Since the introduction of the container FAK tariffs have hidden a complex reality: the rates vary by customer even for the same destination, and are frequently determined by the importance of the customer to the shipping line and the total volumes being shipped for this destination. This reality makes it extremely difficult to apply the average values that are published. In addition, container freight rates in practice comprise a charge per TEU as well as a set of surcharges that may be higher than the rates negotiated with the shipping lines [13]. The existing literature does not always make this distinction clear.

In reality, shipping lines sell space on ships using a tariff grid for each port of call. It is differentiated according to the type of container, 20ft, 40ft, refrigerated etc. These grids were established by the conferences, and their members are supposed to apply them across the board. In 2008, the block exemption of the conferences serving Europe was lifted by the EU, and now the grids for the European trades are set by each carrier, resulting in a supposedly differential rate structure.

The grids provide a sort of “official tariff”. However, there has always been a great deal of latitude in dealing with large-volume customers, for whom a separate grid is established. These major accounts are typically major industrial enterprises, large importers and distributors, and major freight forwarders. The special grids differ for each of these clients, because their freight-slot purchases are different. In the case of the company providing the data used here the rates offered the forwarders are revised every quarter, which allows the carriers to adjust the rates fairly frequently in response to market conditions. For the shippers, however, rates are fixed for
twelve month periods, typically. Terms of volume commitment exist only in American contracts in the case of this company. The rates quoted to the major customers are for full containers. The issue of repositioning empty containers is not charged directly to customers since it is a cost problem for the carriers alone. In cases where repositioning is a significant cost factor, this carriers levy a ‘traffic imbalance’ surcharge per full container [13].

Data sources for this study

The freight rates employed in this paper were provided by one of the top three global container shipping lines. The rates used are those charged to some of the largest forwarders. While the rates accorded to these major customers may be lower by 10-25% than the grid of rates charged to other customers, the size of the forwarders and their importance in European trades means that they account for a very large percentage of traffic carried by the carrier. In addition, the fact the same type of client is being used means that that variations in rates are not due to the quality of the client. It thus ensures a high degree of consistency in the rates between the reporting periods.

The rates were collected for the month of June 2007, 2008, and 2009. Because freight rates vary throughout the year it was decided to select the rates for one month. June was chosen because it represents a month in between the slow period of the early spring, and before the traffic peaks of the fall. The three years selected are significant particularly because it includes June 2007 which was just prior to the onset of the world economic crisis, and the two following years that were marked by significant impacts of the crisis. It also covered the end of the conference system in October 2008.

Although rates for both imports and exports were collected, this study focuses on the imports to Europe. The original data set comprised rates in either dollars or euros, depending on the market and for 20ft (TEU) and 40 ft (FEU) containers. Here, the rates are standardized in euros, the rates being converted at the exchange rates for June 1 of each of the years in question. Only FEU container rates are used. The resultant data are contained in table 1.

Freight rates and relative distance

It is very evident from table 1 that there are considerable differences in the rates between ranges and this has significant consequences for how economic space is structured. One method to depict this economic surface is to map it. This paper begins by providing a unique perspective of the spatial structure of the world as organized by freight rates as a measure of economic distance. The distinctions between physical and economic distance will be clearly revealed. Since the table indicates also important temporal shifts in freight rates, mapping the changes for the three years will help clarify their spatial dynamics. In this section of the paper two aspects of the geography of freight rates are presented, one in terms of spatial patterns, the second in terms of temporal change. These descriptions form a base upon which analysis and discussion of the shifts is provided.
TABLE 1 Average freight rates for imports, European Northern Range, 2007, 2008, 2009 (in Euros)

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</thead>
<tbody>
<tr>
<td>East Coast South America (ECSA)</td>
<td>1,325</td>
<td>8%</td>
<td>1,425</td>
<td>-14%</td>
<td>1,225</td>
</tr>
<tr>
<td>West Coast South America (WCSA)</td>
<td>1,267</td>
<td>-8%</td>
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<td>826</td>
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<td>683</td>
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<td>383</td>
<td>-22%</td>
<td>300</td>
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<tr>
<td>Middle east (MEast)</td>
<td></td>
<td></td>
<td>1,159</td>
<td>-33%</td>
<td>777</td>
</tr>
<tr>
<td>South Asia (SAsia)</td>
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<td>24%</td>
<td>1,481</td>
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<td>476</td>
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<td>Mexico</td>
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<td>53%</td>
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<td></td>
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<tr>
<td>Australia</td>
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<td>-14%</td>
<td>1,095</td>
<td>3%</td>
<td>1,13</td>
</tr>
<tr>
<td>West Africa (WAf)</td>
<td></td>
<td></td>
<td>1,26</td>
<td>-4%</td>
<td>1,209</td>
</tr>
</tbody>
</table>

Freight rates can be considered also a measure of relative economic distance. They represent the costs of overcoming physical distance separating shippers and customers. However, unlike the metric of time, mapping economic distance as indicated by freight rates is undeveloped, particularly on a large scale. Even in such spatially-focused disciplines such as Regional Science or Economic Geography spatial patterns of rates are greatly simplified and are assumed to be shaped largely by relationships with distance [8].

Here, with the extensive data set available it is possible to produce maps that indicate the locations of the maritime ranges in economic space. Map design and construction was achieved by grouping together ports in the same maritime range. The 12 regions identified are then located on an equidistant map based on a grid comprising 500 euro distance bands. North America had to be excluded because of the unique structure of the rates which include land transport costs as all-in rates, and the data set received for 2007 did not include rates for Africa, the Middle East and Central America. The ranges considered are shown in dark shading but their size and shape are exactly the same as they possess in absolute space. Their relative positions are based on the average rate applied to the ports in each region (the ports are located as dots). The degree of displacement in economic space from their actual location in absolute space is revealed. The locations where they are plotted are correct for their economic distances from Northern Europe, but for the sake of clarity (frequently Australia and China would overlap) the vector in which they are positioned may not conform to the exact orientation from the Northern Range.

Changes in relative space

Three strikingly different representations are indicated by the maps for 2007, 2008 and 2009.
June 2007 was just prior to the onset of the global financial crisis and the economic recession that followed. World trade was booming and shipping lines were profiting from the market growth, seeking to add still further capacity in order to exploit markets that seemed to be expanding continually.

The map of 2007 (see figure 1) reveals significant discordances between the relative and absolute locations of the ranges for which data are available. The bull markets of China, Korea, Japan and South-East Asia appear relatively further away from Northern Europe than their geographical locations suggest, and the South Asia and Eastern Mediterranean ranges repeat this pattern. On the other hand, the South American ranges appear to be located in relative space close to their absolute locations. Only Australia is indicated as being relatively closer to Europe than in reality.

FIGURE 1 Economic Distance (container freight rates) June 2007
2008 was marked by the real onset of the global crisis (see figure 2). Of the ranges mapped in the previous year, the Eastern Mediterranean (on the map referred to as the Levant) and South East Asia ranges have moved closer to their locations in absolute space, and the East Coast South America range maintained a spatial accordance in both absolute and relative space. China and Japan have moved somewhat closer to their absolute locations, but Korea has been drawn significantly closer to Europe than the previous year. Australia maintains its relative proximity, while South Asia and the West Coast of South America ranges have moved significantly further away in relative space. Of the three new markets, the Middle East and West Africa are significantly further away from the Northern Range in economic space, but Central America is the opposite, being much closer relatively to Europe.

FIGURE 2 Economic Distance (container freight rates) June 2008
By June 2009 the economic crisis was in full spate. A combination of traffic declines and additional capacity helped transform economic space (see figure 3). Strong centripetal forces seem to be pulling most ranges closer to Europe than before. All the ranges in East, South East and South Asia, Australia, Mexico in varying degrees are closer to Europe in relative space. Indeed, Japan appears to be close to Europe’s doorstep! Central America and the Middle East are now somewhat further away from Europe relatively, while the West Coast of South America appears to be almost off the map in relative space!
Temporal variability

It is clear from the previous descriptions that there are differences in the spatial configuration and change from one range to the next.

The markets of East and South East Asia generated the largest traffic volumes to Europe and incurred some of the highest freight rates in 2007. Thereafter, however, the rates plummeted (see table 1). Even here, two distinct trends are evident. In the case of China and Japan the trend of the decline over the three years was continual. However, for South East Asia (including Singapore, Malaysia, Indonesia and the Philippines) and Korea, the rate of decline was very pronounced between 2007 and 2008. On the other hand their rates stabilised somewhat in 2009.

There are several ranges whose relative locations with other ranges have remained more stable throughout the period. Australia occupies a location relatively close to Europe throughout, and its freight rates have not shifted significantly over the three years. The Eastern Mediterranean, Middle East, East Coast South America and West Africa ranges also exhibit much less volatility than those in East and South East Asia.

There are two aberrant cases. South Asia presents a trajectory that is a hybrid; its rates increased moderately between 2007 and 2008, but fell significantly from 2008 to 2009, at a rate of decline comparable to the trend of China and Japan. West Coast South America exhibits a unique trend line, with a very strong increase in freight rates from 2008-2009.

Analysis and relationships

There is an old saying that a map is worth a thousand words. It is beyond the scope of one paper to explain all the changes the maps reveal. Rather, the mapping results are employed to re-visit some of the more important relationships with freight rates that have received attention in the academic literature and to analyse some of the consequences of these relationships.

Distance

Freight rates as a measure of economic distance reveal a spatial pattern in figures 1, 2, and 3 that distorts the absolute space typical of Atlases. Yet physical distance has long been claimed as being related to transport costs. Freight rates are presumed to increase because the greater the distance travelled the more fuel will be consumed and the fewer voyages per year will be possible. In the absence of true transport costs, distance has often been substituted as a surrogate in quantitative analyses [3, 9].

Distance as a factor has received particular attention in international trade studies and maritime transport. Most of the studies treat transport or shipping costs rather than freight rates alone. For example, it has been claimed that increasing transport costs by 10% reduces trade volumes by 20% [2], while a doubling of absolute distance increases transport costs by 20% [9].
In recent years, however, several studies have refuted these claims. For example, a 2010 study produced by the OECD indicates that many factors influence transport costs and that “the aggregate effect of distance on transport costs is, to say the least, complex.” [6]. Another study has concluded that “Theorists should re-evaluate the role of distance in trade models and refrain from using distance as a proxy for transport costs.”[11]. The pendulum in recent years appears to be moving away from recognising the importance of distance in transport cost studies.

There has been much less research on the effect of distance on freight rates. One of the few is a study on shipping in the Caribbean [6]. Using freight rates for one month provided by a carrier the authors indicate that distance accounts for only 20% of the statistical variance in freight rates. On the other hand, the study indicates that several other factors have statistically significant relationships with freight rates, including transhipment versus direct services, the number of competing carriers, an index of liner shipping connectivity, transit time, and port infrastructure endowment in the importing and exporting countries.

In the present study the maps indicate a degree of discordance between relative and absolute space. Differences appear in all three years, but it would appear that the years of the recession (2008 and 2009) exhibit the largest discrepancies. This perception is somewhat confirmed by simple correlation, where a statistically significant result suggests that nearly half the variance in freight rates is accounted for by distance in 2007. In contrast the other two years indicate no relationship at all (see table 2). The collapse of freight rates in several major markets in 2008 and 2009 has clearly impacted on the significance of physical distance, and suggests that other factors have become much more important.

<table>
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<tr>
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<th>2007</th>
<th>2008</th>
<th>2009</th>
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<tbody>
<tr>
<td>distance</td>
<td>0.705087*</td>
<td>0.166355</td>
<td>-0.21651</td>
</tr>
<tr>
<td>traffic</td>
<td>0.716612*</td>
<td>0.161374</td>
<td>-0.34098</td>
</tr>
<tr>
<td>size of largest vessel</td>
<td>na</td>
<td>na</td>
<td>-0.65394*</td>
</tr>
</tbody>
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* p-value significant at <.005

TABLE 2 Correlations between rates and distance, traffic by country and size of the largest vessel

It is evident that the debate in the broader literature over distance/costs is not really applicable to this study. Freight rates represent only one component of transport costs. Some of the other components of transport costs are non-spatially determined, such as landside port costs and efficiency, so it should be no surprise that the evidence of relationships with distance should be so inconclusive. In the case of freight rates, the lower strength of correlation with distance in the Caribbean study, at least compared with the 2007 results here, could be due to the fact that half the freight rates between port pairs in that sample involved transshipment, where potentially higher costs are incurred [10]. In this study nearly only 25 per cent of the destinations involved transshipment and that when the carriers own feeder services are used there are no differences in freight rates compared to the rates quoted for direct services.
This paper has considered distance and freight rates as two different measures of distance, one absolute, and the other relative. The evidence presented indicates that relative metrics are inevitably more dynamic and spatially uneven. Although not evaluated here other relative distance factors may be equally related to absolute distance. For example, transit times influence slot costs, and will be reflected in some degree to the rates charged. If the evidence for the link between physical distance and freight rates is inconclusive, market conditions can be expected to play an even more important direct influence. In the following section the relationship between rates and markets are considered.

\textit{Market conditions}

Economists have long connected market conditions with freight rates. The equilibrium price in shipping markets is where the availability and quantity of freight to be carried is equal to the supply of shipping provided by the carriers [9]. Market conditions certainly appear to have played an important role in accounting for the considerable spatial shifts that were the result of high volatility in rates. It is significant that the most volatile of markets between 2007 and 2009 were the largest. For example, in 2007, Asian markets were significantly further away from Northern Europe than their absolute location would suggest, while by 2009 they were among the closest to Europe.

The evidence indicates that carriers charged high rates in many of the trade lanes with Asia because of the size of the trade flow in periods of economic prosperity, as in 2007. The very high rates appear in fact to be beyond theoretical equilibrium values during periods of high demand in these markets. Companies appear to have sought to maximise revenues (and profits) in the strong markets, despite competition. Stopford provides a slot cost estimate of $360 for an 11,000 TEU vessel on the Europe-Asia trade, indicating very high levels of profitability on that route in 2009 [4] based on the rates presented here. However, competition and lowering demand forced the companies to lower their rates to levels that fell in some cases to be below cost. For example, rates from China to Northern Europe fell from 2,300 euros per FEU in 2007 to 212 euros in 2009. The fall in rates greatly exceeded the drop in traffic, estimated to be around 20% less than 2007 totals.

On the other hand, the ranges exhibiting the greatest stability tend to be niche markets, that is to say markets that are small that generate smaller numbers of containers. Thus, for Australia, Eastern Mediterranean and Middle East ranges, West Africa and Central America, the difference in rates for the ports in the range is less than 400 euros over the period per FEU. Indeed, in the case of Mexico and the West Coast of South America rates actually increased. Yet it is in these markets where there are fewer carriers and therefore less competition where in theory oligopolistic pricing could be applied.

It is difficult to test the relationship between market size and freight rates with any degree of precision, mainly because the available surrogate data are so imprecise. One possible independent variable was applied: annual container traffic by range for each of the three years. The results are somewhat similar to those with distance (see table 2). Only in 2007 is there a statistically significant relationship, and the other years indicate no correlation. It suggests that
the disproportionate decline in freight rates involving the largest markets has distorted patterns
during the recession. It must be recognized, however, that the surrogate value is very imprecise.
The actual number of containers shipped between each market is not available, as the data set
employed is based on total traffic for each range as a whole, and does not separate European
Northern Range shipments in particular.

Some evidence for oligopolistic pricing may be obtained by examining round trip rates. Carriers
in preparing to negotiate with major clients over rates base their slot calculations on their costs
for the round trip. Thus the relationship between import and export freight rates must be
considered. A comparable data set for imports and exports involving the ports of East and South
East Asia for the same three years was compiled (see table 3). It reveals expected variations in
rates over the three years, but whereas import rates for these markets have declined spectacularly
from 2007 to 2009, export rates, while smaller, have actually increased during the same period.
A complete reversal of trends is evident, when import rates to Europe are high, export rates are
low, and conversely when import rates fall, export rates are at their highest. In 2009, the decline
in import rates has brought them closer to the export rates.¹

These observations add weight to the hypothesis presented above: when the demand in certain
markets is large and growing, the shipping lines are able to charge very high rates and achieve
high profitability, which in 2006 and 2007 the carriers were turning into placing new orders for
ships to expand their capacities. However, faced with a decline in the demand for Asian imports
into Europe, rates collapsed on this one segment of a service, and the carriers raised rates
somewhat on the return leg to compensate. The problem is that volumes are not well balanced on
the Europe-Asia trades with imports still being much greater than exports. Thus, increasing
freight rates from Europe could not compensate the losses on the import trade during the
economic crisis. The shipping lines were selling under their breakeven point.

For the other markets which we have called ‘niche’ not only is more stability evident in general
(see table 3), but there is greater balance in rates between the import and export trades. We
suggest that because these markets are smaller, they have been less prone to massive swings in
freight rates. The two exceptions to this observation are ECSA in 2007 and WCSA in 2009 (see
the next section).

Economic space and development

The mapping exercise and the subsequent discussions permit some insights to be drawn on the
question of freight rates and economic development. The lead author’s previous research
experience in developing markets focusing on costs [12, 13] and the broader literature detailing
difficulties developing countries face in accessing export markets [2] led to an examination of
the role of freight rates as a barrier to economic development. This is at the basis of claims that
lesser developed economies have a freight rate disadvantage with major advanced nations, since

¹ Care must be taken in interpreting these results. The export rates for Far East destinations in 2009 only, included
three surcharges: Terminal handling costs, Bunker adjustment factor, and Currency adjustment factor. If these
surcharges had been removed, the base rates would have been negative! [7]
the rates on the outbound leg from the developed markets are lower than those on the return voyage from the developing countries [14].

The evidence appears to support this contention, at least during the boom year of 2007. European exporters did possess a transport cost advantage over the emerging markets. The theoretical literature [4] and the data presented in this paper provide an answer. If the market is working then small economies should be more expensive to serve than larger ones, if the trade volumes are small. In most of the examples in Table 3 the imbalance of rates between inbound and outbound shipments from Europe is due to the large inflow of goods imported from Asian markets to Europe during the economic boom and ECSA throughout. As suggested in the previous section, the carriers have sought to maximize revenues, despite the presence of large numbers of competitors in the market. Table 3 indicates that the advantage possessed by European exporters was not maintained in 2009, however, but the rates for imports and exports are closer than the previous years.

<table>
<thead>
<tr>
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<th>2007</th>
<th>2008</th>
<th>2009</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>imports</td>
<td>exports</td>
<td>imports</td>
</tr>
<tr>
<td>China</td>
<td>2,235</td>
<td>82</td>
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<td>1,788</td>
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<tr>
<td>ECSA</td>
<td>1,325</td>
<td>200</td>
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<tr>
<td>WCSA</td>
<td>1,267</td>
<td>1,400</td>
<td>1,166</td>
</tr>
</tbody>
</table>

**TABLE 3 Northern Range European Import and Export freight rates for selected markets (in €)**

The evidence from the WCSA is more ambiguous, with no clear pattern over the three years. However, the considerable spike in import rates in 2009 of WCSA is due to the rapid growth in the region’s exports to Europe. Based on port data for the port of Rotterdam, container exports in 2009 from WCSA to the port were 410 per cent higher than imports.

Earlier work in West Africa revealed that even in 1996 Asia was closer to Europe than Africa in terms of economic distance partly because of differences in vessel scale economies [13]. But economic distance was approached by the slot costs instead freight rates. The issue of scale economies in container shipping has become even more important factor in recent years [1, 15]. Economies of scale are very significant, and in the last ten years the carriers have been engaged in a massive upscaling of their fleets. The larger (and newer) vessels not only carry more boxes than smaller vessels but they are more fuel efficient and their operating costs are relatively lower. Thus, the slot costs of deploying large vessels are extremely advantageous, especially where voyages are long [1]. It is for this reason that all the major carriers have been deploying their largest vessels on the Europe-Asia trade routes. The smaller vessels are retained on the thinner trade lanes, and this results in higher rates because of their higher slot costs. This relationship is confirmed when vessel size is correlated with freight rates in 2009 (see table 2). This is the only
statistically significant correlation obtained for 2009, and reveals a strong inverse relationship
with freight rates.

In conclusion, the extent to which freight rates act as a barrier of trade and economic
development appears questionable. Many developing countries, such as Philippines, Pakistan,
India and even China appear not to be constrained by rate differentials with European exporters.
The Latin American markets do not indicate a consistent pattern in favour of one or the other.
However, it must be remembered that freight rates represent only one component of transport
costs, and port inefficiencies, poor hinterland connections may weigh much more heavily in
some developing markets.

Conclusions

This paper has focused on freight rates provided by a major global carrier. As indicated, the
rates employed possess a high degree of consistency, because they apply to the same category of
customer for the same equivalent month over the three years. This cannot be claimed for other
available sources of freight rates that are either composite values, based on averages, or may or
may not include surcharges. Although this paper has examined the rates of one major carrier
only and on the European trades in particular the EU regulations are seeking to promote rate
competition between shipping lines, overall these differences among the global carriers is not
that great, since they compete in the same markets and in many trade lanes they cooperate in
various forms from slot shares, to joint services.

Economic space as defined by economic distance measured by freight rates is shown to be highly
variable from one year to the next. The largest markets appear to be located in relative space far
from their absolute locations during periods of growth, as the carriers impose almost
monopolistic pricing in a competitive market. A 10-20% drop in traffic draws these larger
markets much closer to the European Northern Range in relative space. Thus China which in
2007 in relative space is located in the Antarctic Ocean, in 2009 is in Central Siberia! Such
spatial shifts are shown to be less pronounced in many of the smaller markets. Australia, for
example is shown to be persistently closer to the Northern Range in relative space than it appears
in absolute space. West Africa maintains the same stable relationship over the two years for
which data are available, albeit at a greater distance from its absolute location.

As a measure of economic distance therefore freight rates give rise to spatial patterns that are
distinct from how the world is arranged using absolute distance. Comparing relative distance
and absolute distance helps confirm what some academic literature suggests that physical
distance is an imperfect surrogate for actual freight rates.

While market size plays a role in determining freight rates (as indicated by economic theory) a
consideration of the resulting spatial patterns suggests that this role is contradictory. In the
largest markets where competition is greatest, the carriers have been able to impose very high
freight rates during a period of growth. On the other hand the global economic crisis had a
catastrophic effect in the major trade lanes, resulting in the shipping lines offering freight rates
that were below cost, and producing the enormous shrinkage in relative space noted above. One
factor that appears significantly related to the changes is vessel size and scale economies. In

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periods of high demand the capacity of mega-ships provides the ability to move large quantities of containers at prices that exceed costs by a wide margin. During periods of low demand the costs per slot work in the carriers’ favour too because of operational efficiencies.

Evidence is presented that developed economies have a rate advantage over developing economies since inbound rates to Europe are higher than what European exporters pay to access those markets. This is clearly a function of demand and competition. The trend is most pronounced in 2007 when the European demand was great, and significant trade imbalances with many developing countries existed. What is also evident is that the trend reversed itself in 2009 at the bottom of the European recession when Asian exporters in particular had a rate advantage. Does this constitute a barrier to development? In the context of Asia and South America the differences between inbound and outbound rates does not.

A further line of research would be to conduct an analysis centred on rates between other major ranges and markets around the world, for example on the US or China. How consistent are the spatial patterns of freight rates centred on those markets? The hypothesis that carriers achieved virtual oligopolistic pricing in a competitive market requires further confirmation and explanation. Similarly, the empirical evidence of return rates indicates that the carriers have been raising rates on return voyages in markets where the outbound rates had fallen most. Is this related to actual traffic growth on the return voyages, or is it as hypothesised a strategy to offset some of the losses incurred on the outbound voyages?

References


