



BULLETIN

FAL

FACILITATION OF TRANSPORT AND TRADE IN LATIN AMERICA AND THE CARIBBEAN

# Maritime reefer trade in South America: a comparison of the west and east coasts

## Background

Reefer trade is a rapidly growing market in South America which has increased the demand for maritime refrigerated transport (or containerized transport) and led to structural changes in the industry. Not only has this created competition for conventional reefer vessels, because of major investments made by liner services, but it has also led to changes in the perishable goods trade, for example, in the port infrastructure and the service structure. In 2011, reefer exports accounted for 12% of the value of total exports from the east and west coasts of South America, equivalent to US\$ 40 billion.

This issue of the FAL bulletin discusses maritime reefer trade in South America. It also highlights export trends since 1995, current export volumes and the principal destinations for exports from the west and east coasts of South America in order to show how the demand for maritime reefer services has changed. It compares the geographical coverage, scale and market competition of the two types of carriers. This issue uses findings from *Maritime bulletin* numbers 50 and 52, which are based on extensive research carried out of the two coasts.<sup>1</sup>

## I. The demand for reefer services in South America

South America has a significant share of global reefer trade, accounting for 30% of global reefer exports by volume, equivalent to 30 million tons of perishable goods in 2011. The east and west coasts export the same volume of perishable goods (BADECEL, 2013).<sup>2</sup>

<sup>1</sup> Maritime bulletin number 50 examines reefer trade on the west coast of South America, while Maritime bulletin number 52 looks at reefer trade on the east coast.

<sup>2</sup> The north coast of South America exports the lowest volume of perishable goods of the three subregions. Reefer exports account for 1.5% of total export volumes on the north coast, reaching 2.1 million tons.

This issue of the *FAL Bulletin* examines the scale of maritime reefer trade in South America and the developments made in this area since the 1990s. It also looks at the increase in the capacity of liner services and the relationship between conventional and containerized reefer vessels in terms of trade volume, commodities exported and the destinations for exports from South America. The author of this bulletin is Ruth O. Vagle of the Infrastructure Services Unit of ECLAC.

The views expressed in this document are those of the author and do not necessarily reflect the opinions of the organization. For more information, please contact [trans@cepal.org](mailto:trans@cepal.org).



Background



I. The demand for reefer services in South America



II. Export destinations



III. Container capacity supply



IV. Conventional reefer trade in South America



V. Conclusions



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UNITED NATIONS

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In 2011, the value of reefer exports from the west coast increased to US\$ 17.7 billion. The west coast is the leading exporter of fruit,<sup>3</sup> which accounts for 90% of the export volume and 85% of the reefer export value for the subregion. Fish accounts for 10% of the region's export volume, but makes up 41% of reefer export values. The main exports from the west coast are bananas (5.3 million tons), apples (960,000 tons), grapes (900,000 tons), fresh and frozen fish (570,000 tons), tropical fruit (440,000 tons) and crustaceans and molluscs (420,000 tons).

In 2011, the east coast recorded the highest reefer export values in the region, amounting to US\$ 30 billion. And so, although export volumes were the same for the two subregions, export values from the east coast were 40% higher than those from the west coast. This was attributable to the higher unit values of meat exports in comparison to fruit exports. Meat exports accounted for 63% (6.6 million tons) of the export value of perishable goods from the east coast and although 6.3 million tons of fruit were exported, this was equivalent to only 23% of the reefer value for the subregions. The main perishable goods exported from the east coast were poultry (4 million tons), citrus fruits (1.6 million tons), bovine (1.5 million tons), pears and quinces (700,000 tons), swine products (460,000 tons) and apples (400,000 tons).

Reefer exports have grown considerably over recent years in both subregions. The strongest growth has taken place on the east coast, where reefer export volumes have increased by 178% since 1995, at a compound annual growth rate (CAGR) of 7%. The increase in its reefer export value has been even faster (271%), with a CAGR of 9%. The fastest growing perishable has been meat, with a CAGR of 12% for both export value and volume. The growth of fruit exports was lower, but the CAGR of 6% for export value and 5% for export volume were still significant. Meanwhile, reefer export volumes for the west coast increased by 72%, at a CAGR of 3% during the same period. Reefer export values increased by 178% at a CAGR of 7%. Since 1995, fruit exports have grown at a CAGR of 7% for export value and 3% for export volume. Seafood exports grew at a CAGR of 5% for both export values and volume.

### A. East coast of South America

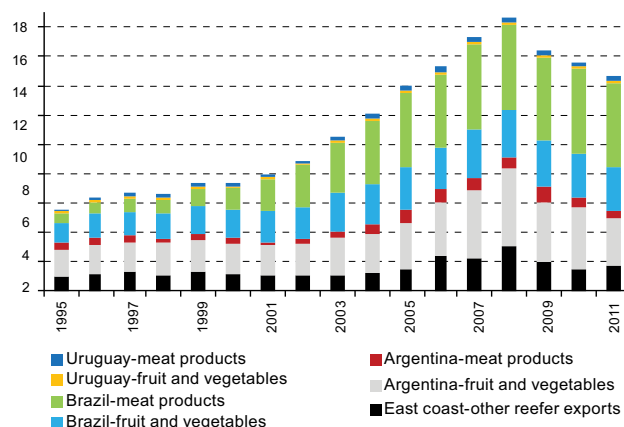
Brazil exports 62% of the perishable goods from the subregion, making it the largest reefer exporter on the east coast. It is the second fastest growing reefer exporter in South America after Peru, with a CAGR of 11% for export values and 10% for export volume. Meat, particularly poultry<sup>4</sup> (70%), is the main reefer export from Brazil.

<sup>3</sup> A similar, even stronger tendency is found on the north coast where perishable exports consist of fruits only.

<sup>4</sup> Despite a strong domestic demand for poultry, Brazil is the leading poultry exporter in the world.

Poultry exports have grown rapidly at a CAGR of 9% since 1995. In 2011, the country exported almost 4 million tons of meat, which was 65% of the total reefer export volume for the east coast. The second largest export was orange juice, which amounted to 2 million tons, followed by bovine<sup>5</sup> and fresh fruit,<sup>6</sup> particularly melons and mangoes (see figure 1).

Figure 1  
EAST COAST REEFER EXPORT VOLUMES, 1995-2011  
(Million tons)



Source: Prepared by the author on the basis of data from the Statistical database on foreign trade, (BADECEL, 2013).

Argentina is the second largest exporter of perishable goods on the east coast and accounts for 33% of reefer export volumes from the subregion. Between 1995 and 2011, the reefer export value and volume in Argentina grew at a CAGR of 4%. The main export from Argentina was fruit (70%), particularly pears and quinces (500,000 tons), followed by poultry (300,000 tons) and citrus fruits (250,000 tons).

Uruguay exports the lowest volume of perishable goods in the region, with a marginal share of 5% of export volumes from the east coast. Reefer exports from the country have increased at a CAGR of 9% for export value and 5% for export volume. Despite its low export volume, Uruguay's exports are the most diverse in the region. They consist of meat (41%), fruit and vegetables (24%), dairy products (22%) and seafood (12%). The primary perishable export is bovine (250,000 tons), followed by oranges (150,000 tons).

### B. West coast of South America

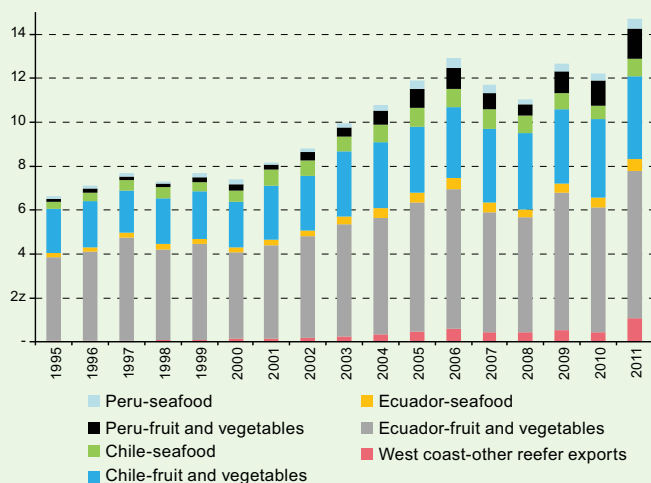
Ecuador is the leading exporter on the west coast, accounting for almost 51% of the total export volume from the subregion. The reefer export value and volume have increased at a CAGR of 5% and 3%, respectively, which

<sup>5</sup> Bovine exports from Brazil were equivalent to 1 million tons in 2011.

<sup>6</sup> Brazil exported almost 700 tons of fresh fruit in 2011.

represents the most modest growth in the subregion. Bananas are the main perishable goods exported (5.7 million tons), followed by fish and seafood (300,000 tons). Banana exports from Ecuador are declining. For example, in 2005, 60% of fruit exports were bananas, while today, the market share has increased to 96% (see figure 2).

Figure 2  
WEST COAST REEFER EXPORT VOLUMES, 1995-2011  
(Million tons)



Source: Prepared by the author on the basis of data from the Statistical database on foreign trade, (BADECEL, 2013).

Chile is the second largest exporter on the west coast (4.8 million tons) and accounts for 35% of reefer exports from the subregion. Reefer exports have grown at a CAGR of 7% for value and 4% for volume since 1995. In 2011, fruit and vegetables accounted for 80% of reefer

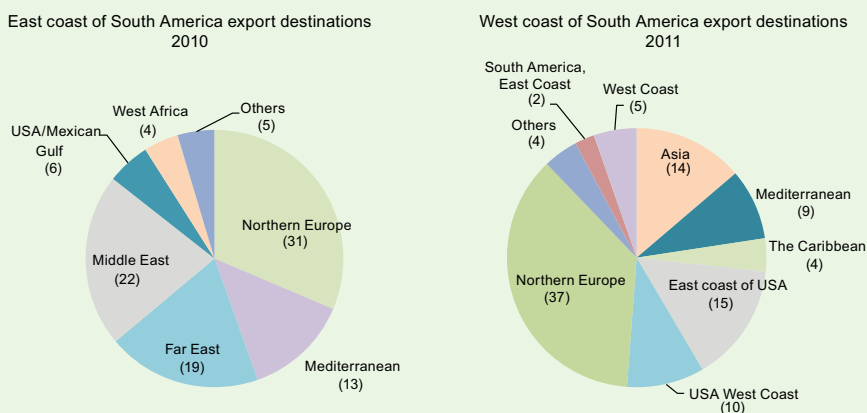
exports from Chile, followed by fish and seafood (13%). The volume of grape and apple exports was 850,000 tons each. Apple exports have grown significantly in recent years because it is a durable fruit and hence easier to transport. Grape exports, however, have declined because they are harder to preserve in terms of firmness and form and therefore the production and cold chain management system is much more challenging. In 2011, 550,000 tons of fresh fish were exported, making it the third largest perishable goods export. This figure represents a 22% increase compared with the previous year. Chilean fish and seafood exports are growing rapidly and have completely recovered from the outbreak of a disease that affected salmon exports between 2007 and 2011. During that period, the value of Chilean salmon exports dropped by 50%.<sup>7</sup>

Peru accounts for 14% (1.9 million tons) of reefer exports from the region, making it the smallest exporter on the west coast. Despite this, it has shown the fastest growth in reefer exports in South America since 1995, with a CAGR of 11% for export values and 12% for the export volume. Peru's main exports were fresh fish and seafood (300,000 tons), vegetables (330,000 tons), tropical fruit (245,000 tons) and grapes (115,000 tons). Fruit exports are expected to grow because land availability, low production costs and the country's reputation as a producer of high-quality fruit mean that it has great potential for crop expansion.

## II. Export destinations

The primary destination for all reefer exports from South America is Northern Europe. Figure 3 shows the destinations for exports from the east and west coasts.

Figure 3  
SOUTH AMERICA, REEFER EXPORT DESTINATIONS  
(Percentages)



Source: Prepared by the author on the basis of data from (Hamburg Süd 2012; Drewry 2011), Reefer trade WCSA: Market Statistics, Santiago, March.

<sup>7</sup> Between 2010 and 2011, salmon export values grew by 42%, indicating a complete recovery of the salmon business (Méndez, 2012).



On the west coast, Peru and Ecuador rely mainly on the European market. Around 50% of reefer exports from these countries are to Europe. Chile's main export destination is Asia and it has the highest share (18%) of this market in the subregion.

On the east coast, Argentina and Uruguay mainly depend on the European and Mediterranean markets, shipping 40% and 50% of their reefer exports to Northern Europe, and 19% and 16% to the Mediterranean. Brazil depends on three export markets, Northern Europe (28%), the Middle East (28%) and the Far East (22%). As a result, Brazil is the only reefer exporter in the subregion with a strong market share in the Middle East.

#### A. Import composition of the main importing regions

In 2011, approximately 5.2 million tons of perishable goods were imported by Northern Europe from the west coast. They consisted of bananas (55%), apples (6%) and grapes (6%). That same year, Northern Europe imported approximately 4.3 million tons of perishable goods from the east coast. They consisted of meat products<sup>8</sup> (60%) and fruit, such as fresh grapes, mangoes and citrus fruits (30%).

In 2011, Asia imported about 1 million tons of perishable goods from the west coast, primarily fish (40%) and fruit (40%), in particular, grapes, apples and bananas. That same year, the Far East imported 2.7 million tons of perishable goods from the east coast, including poultry (70%), garlic sauce (6%), bovine (5%) and orange juice (5%).

The Middle East imported 3.1 million tons of meat from the east coast in 2011. That region has the least diverse commodity structure of the importing regions, consisting of poultry (85%) and bovine (11%).

In 2011, North America imported 3.5 million tons of reefer products from the west coast of South America. Of that amount, 40% was imported by the west coast of North America and 60%, primarily fruit, by the east coast. There are only marginal differences between the import structures

<sup>8</sup> Boneless bovine meat (29%), poultry and meat offal (35%) and offal, salted dried, smoked (25%). [Author: this figure does not add up to 60%. What does the 25% refer to?]

of each coast as their demand for commodities is similar. For instance, the west coast of North America mainly imports bananas (40%), followed by grapes (6%), avocados (6%) and apples (5%). The east coast of North America also imports bananas (38%), grapes (9%), onions (7%) and apples (7%).

In 2011, the United States and the Mexican Gulf imported approximately 845,000 tons of perishable goods from the east coast of South America. Garlic sauce was the main perishable good imported (38%), followed by frozen orange juice (27%), pears (11%), grapes (11%) and mangoes (10%). Unlike other importing regions on the east coast, meat imports constitute a marginal share of 4%.

In 2011, the Mediterranean imported 1.3 million tons of perishables from the west coast of South America, primarily bananas (53%), seafood (17%), apples (6%) and kiwis (5%), and 1.8 million tons from the east coast, which consisted of more than 80% meat products,<sup>9</sup> followed by melons (7%).

### III. Container capacity supply

The capacity of dry and reefer containers has increased considerably on all of the principal trade lanes from South America since 2000. The twenty-foot equivalent unit (TEU) capacity increased by 130% on average between 2000 and 2012, while the reefer capacity increased by 200% during the same period. The most significant increase in TEU capacity was by 220% on the trade lane between the west coast and Asia, while the strongest growth in reefer plugs was by 350% on the route between Asia and the east coast during the same period.

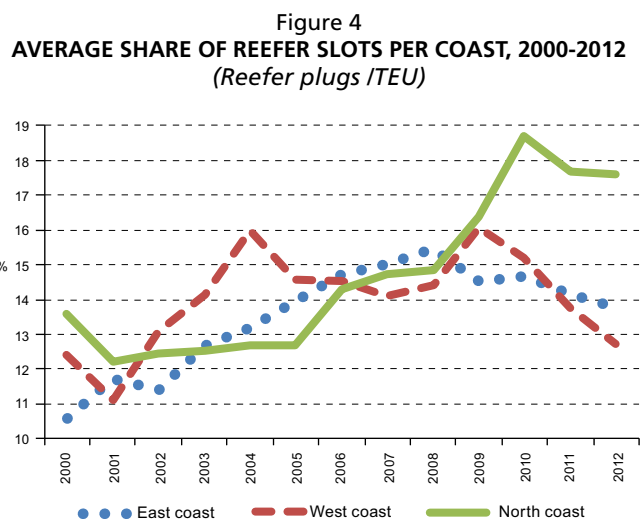
#### A. Scale of reefer supply in South American liner trade

At present, the share of reefer plugs in the total container capacity per vessel is the highest on trade lanes between the west coast and Europe (20%), the north coast and Europe (21%) and the north coast and North America (18%). This is explained by the rapid growth of reefer plugs per deployed vessel and the subsequent modest growth in dry container capacity enhancing the overall reefer share. The refrigerated containers with the largest capacity are used on trade routes between the east coast of South America and Europe. Vessels with the lowest number of reefer plugs operate on trade lanes between the west and north coasts of South America and North America.

The north coast has experienced the strongest growth since 2000 and as a result has the highest number of reefer slots per vessel of the three coasts. The largest increase on the north coast is found on the trade lane to Europe. During the period 2008-2012, the reefer capacity on this trade route

<sup>9</sup> Poultry (42%), bovine (26%) and swine (10%).

increased by 7%, and as a result, it accounted for 21% of the share of reefer slots in 2012. The average reefer capacity per vessel on the east coast is 14%, the second highest in the region, which means that the share of reefer slots increased by 3% over the past 13 years. The west coast has the lowest share of reefer plugs per vessel compared to the other two coasts of South America. The average share of reefer plugs per vessel reached 13% in 2012 (see figure 4).



**Source:** Prepared by the author on the basis of data from Compair Data World Liner Supply, 2012.

The number of reefer slots in South America has actually been declining since 2010. This is because the growth of dry container capacity was faster, particularly on the trade lane to North America.

Slow steaming is not widely used in South America and the Caribbean because of the scale of reefer trade. For example, only 20% of the services operating on South American trade lanes opt for slow steaming, while as much as 70% of those between Europe and the Far East have adopted this practice (Cariou, 2011). This shows the importance of reefer trade for the shipping industry in the region.

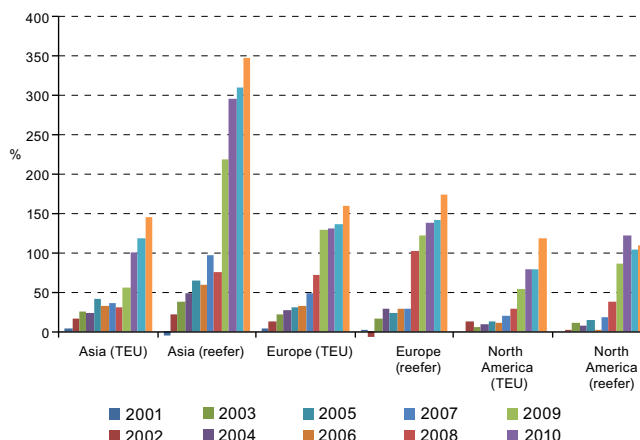
### B. East coast of South American trade

The east coast has the largest container capacity in South America, although it is just marginally higher than the average for the west coast. The average vessel and reefer plug capacity is 4,810 TEUs and 650 reefer plugs, respectively. This means that reefer plugs make up 14% of the container capacity of the average vessel.

The largest vessel capacity departing from the east coast is 5,150 TEUs, on average, and the destination is Asia. Around 13% of its capacity is occupied by the 680 electrical plugs.

Since 2000, the trade lane has increased dry container and reefer capacity by 145% and 350%, respectively, which represents the most significant increase in refrigerated container capacity in South America since 1995 (see figure 5).

**Figure 5**  
**EAST COAST OF SOUTH AMERICA, 2001-2012**  
*(Percentage increase in supply)*



**Source:** Prepared by the author on the basis of data from Compair Data World Liner Supply, 2012.

**Note:** Data refer to the average capacity at April every year. The base year is 2000.

The east coast to Europe route has the second highest container capacity in the subregion, with an average vessel size of 4,535 TEUs and 735 electrical reefer plugs, which make up around 16% of the vessel's container capacity. Since 2000, the trade lane has increased its container capacity and reefer capacity by 160% and 175%, respectively. The trade lane has experienced modest growth in reefer plugs, due to the historically high share of reefer plugs.

The trade lane between the east coast and North America has an average vessel size of 4,000 TEUs and 425 electrical reefer plugs, which make up around 11% of its container capacity. Since 2000, the trade lane has increased its dry container capacity by 120% and reefer plugs by 110%.

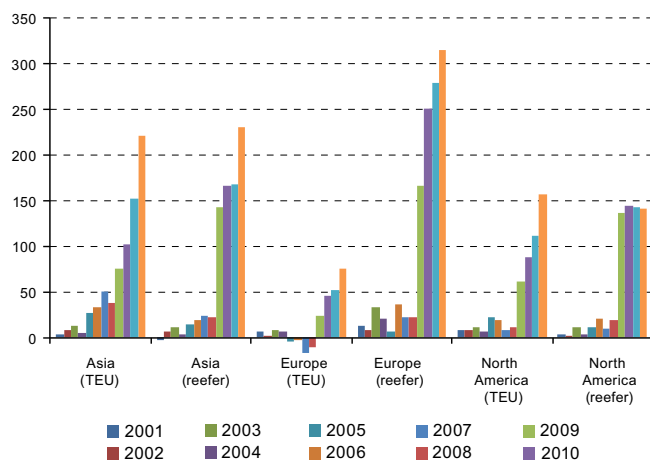
### C. West coast of South American trade

The container capacity offered by the west coast is marginally lower than that of the east coast. The average vessel size and number of reefer plugs is 4,450 TEUs and 560, respectively. This means that the average number of reefer slots accounts for 13% of the vessel capacity.

Asia is the trade lane with the highest capacity within the subregion. The average vessel size and number of reefer plugs is 5,270 TEUs and 595, respectively. The refrigerated

container capacity constitutes 11% of the overall vessel capacity. Over the past 12 years, the capacity of dry containers has increased by 220%, while reefer trade has grown by 230%. This represents the second fastest growth in reefer capacity in the subregion (see figure 6).

Figure 6  
WEST COAST OF SOUTH AMERICA, 2001-2012  
(Percentage increase in supply)



Source: Prepared by the author on the basis of data from Compair Data World Liner Supply, 2012.

Note: Data refer to the average capacity at April every year. The base year is 2000.

The trade lane between the west coast and Europe operates with an average vessel size of 3,400 TEUs and an average of 660 reefer plugs per vessel. The average number of reefer slots accounts for 20% of the container capacity, which is the second highest reefer capacity in South America after the north coast to Europe trade route. Since 2000, the container capacity has grown by 75%, while the reefer capacity has increased more than four times as fast, by 315%.

The west coast to North America route has the second highest capacity, with an average vessel size of 4,700 TEUs and 560 electrical reefer plugs. Since 2000, container capacity has increased by 175%, which is faster than the reefer capacity, which has increased by 142%. In 2012, the number of reefer slots represented 11% of the average vessel capacity.

#### D. North coast of South America trade

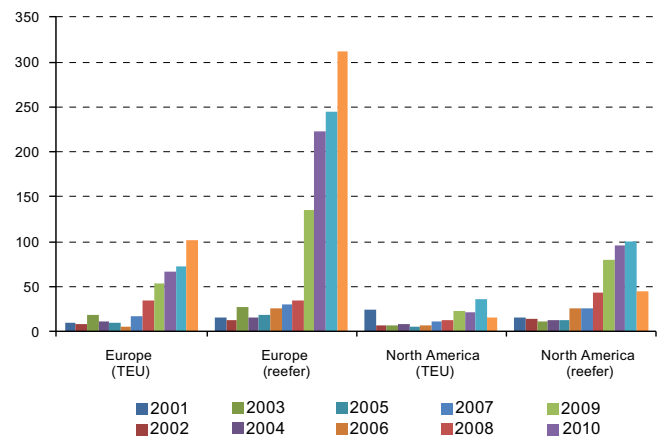
The north coast offers the lowest capacity from South America, with an average vessel size of 2,610 TEUs and 460 reefer plugs.

The trade lane between the north coast and Asia started operating in 2011,<sup>10</sup> and at present, is the lane with the greatest capacity on the north coast. The vessels have an

average size of 4,380 TEUs and an average number of reefer plugs of 450. This means that reefer plugs make up 10% of the total vessel capacity, which is the lowest on the north coast.

The north coast to Europe route has the second highest capacity and it is increasing rapidly. Between 2000 and 2012, its capacity increased by 312%, which was twice as fast as the dry capacity. In 2012, the average vessel size and average number of reefer plugs was 2,710 TEUs and 562, respectively. This means that the average number of slots accounted for 21%, which was the highest share in South America (see figure 7).

Figure 7  
NORTH COAST OF SOUTH AMERICA, 2001-2012  
(Percentage increase in supply)



Source: Prepared by the author on the basis of data from Compair Data World Liner Supply, 2012.

Note: Data refer to the average capacity at April every year. The base year is 2000.

The average vessel size operating between the north coast to North America is 1,930 TEUs with 290 reefer plugs. In this case, reefer plugs constitute on average 15% of the vessel's container capacity. Since 1995, the vessel capacity and number of reefer plugs have experienced modest growth (15% and 45%, respectively) for this route.

## IV. Conventional reefer trade in South America

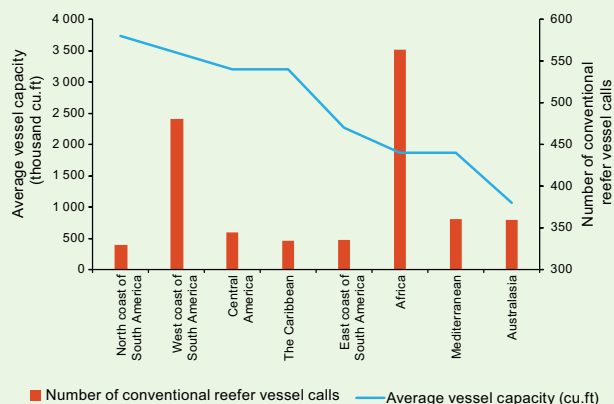
A lot of attention has been focused on conventional reefer's declining market shares.<sup>11</sup> This is largely due to the increasing capacity of liner services, as shown in section III. Since mid-2011, the maritime transport segment offers a capacity of 236 million cubic feet (Drewry 2011). Despite the decline, there is still a strong market for the conventional

<sup>10</sup> This explains why the capacity for this route does not appear in figure 7.

<sup>11</sup> Since 2000, the worldwide supply of conventional reefers has declined by 20%, meaning that 180 vessels no longer operate. For more information, see Maritime bulletin number 50.

reefer vessels. *Maritime bulletin* number 50 outlines and discusses the flexibility and autonomy of conventional reefers. The vessels operate fast, direct services which have a competitive advantage for accessing regions with inferior infrastructure and basic port facilities (see figure 8).

Figure 8  
CONVENTIONAL REEFER VESSEL CALLS,  
2009–2011 (first half)



Source: Prepared by the author on the basis of data from Waals, Frans (2001), Reefer Analysis - Market Structure, Conventional, Containers.

The highest concentration of conventional reefer vessels is found on the African continent, which handles approximately 37% of the global conventional reefer port calls. South America is in second place accounting for 35% of all conventional reefer port calls. The west coast is where most of the activity takes place in South America as it handles 70% of all reefer calls.

Ecuador handles the highest number (60%) of conventional reefer calls in South America. In 2011, conventional reefer vessels had a market share of 40%, which had not yet been overtaken by the containerized vessels. The port of Guayaquil handles the highest share (about 66%) of the country's conventional reefer port calls, followed by the Port of Bolivar (31%). Bananas are the main perishable goods exported by conventional reefer vessels in Ecuador. They are shipped to the Mediterranean (64% market share), the east coast of North America (46% market share), Northern Europe (36% market share) and the west coast of North America (10% market share) (Hamburg Süd, 2012). See table 1.

Despite strong market shares in Ecuador, containerized transport is invading conventional vessel's markets by offering new direct services. An example of this is the Great White Fleet (GWF), a carrier used by Chiquita Brands, which has switched from conventional reefer vessels to containerized vessels on the trade lane between Ecuador and the west coast of the United

States.<sup>12</sup> Similarly, a new direct service,<sup>13</sup> offered by container lines, is shipping cargo traditionally carried by conventional reefers on the trade route from Ecuador to St. Petersburg, which is one of the strongest markets for conventional reefers (Lewis 2013).

Table 1  
CONVENTIONAL REEFER CALLS WEST COAST OF SOUTH  
AMERICA,<sup>a</sup> 2009–2011 (first half)

Country	Port	Conventional reefer calls	Average vessel capacity (thousand cubic feet)
Ecuador	Guayaquil	1 214	540
Ecuador	Bolivar	575	540
Chile	Valparaiso	316	560
Colombia	Santa Marta	167	590
Chile	Coquimbo	113	580
Colombia	Turbo	101	550
Colombia	Cartagena	83	600
Peru	Callao	36	430
Ecuador	Other	47	320
Chile	Other	87	478
Colombia	Other	19	600
Peru	Other	17	560

Source: Prepared by the author on the basis of data from Waals, Frans (2011), Reefer Analysis - Market Structure, Conventional, Containers.

<sup>a</sup> For data on the east coast of South America, see *Maritime bulletin* Number 52.

Chile has the second highest market presence in conventional reefer vessels, handling approximately 16% of port calls in South America. In Chile, conventional reefer vessels have a market share of 25%, which is significantly lower than that of Ecuador. The vessels operate in the export markets to the east coast of North America (45% market share), the west coast of North America (30% market share), and Northern Europe (12% market share). The port of Valparaiso handles the majority of the vessels (60%), while the competing port of San Antonio handles a marginal share of 5%. The port of Coquimbo located in the north of Chile is the second largest port handling 22% of the country's conventional reefers, predominantly handling avocados and grapes (Waals, 2011).

Port calls in Colombia and Argentina constitute 11% and 10% of total conventional reefer port calls in South America. Brazil and Uruguay are negligible markets, handling 3% and 2% of South American conventional reefer port calls.

At present, conventional reefer vessels have a negligible market share in the east coast of South America. This region received both types of vessels up until 2006, when there was a considerable increase in the capacity of the liner services. Since then and over a period of seven years, the capacity of refrigerated containerized transport

<sup>12</sup> The GWF is replacing three reefers with two container vessels with an average capacity of 2,600 TEUs and 500 reefer plugs, built in 2010 (Lewis, 2013).

<sup>13</sup> The trade lane between Ecuador and St. Petersburg is operated by Maersk, which has a vessel capacity of 2,600 TEUs and 500 reefer plugs (Lewis, 2013).

more than doubled, while at the same time providing a reliable, fast service. Based on their economies of scale and competitive transit times, the container lines gained market shares from conventional reefer vessels, which were reduced to niche services and operations during peak export seasons (Damco, 2013).

## V. Conclusions

There has been impressive growth in the demand for reefer exports from the west and east coasts of South America since 1995, and today, they export 30% of the global reefer trade. The export volume for the two coasts is the same, but the export composition differs. The export value for the east coast was 40% higher than that of the west coast due to its high share of meat exports. However, the export value for the west coast is expected to increase due to the recent recovery in exports of fish, a promising market with a high demand from Russia and the Far East.

The most rapid increase in reefer exports since 1995 was observed on the east coast, where export volumes have grown three times as fast as those on the west coast, and Peru and Brazil are the fastest growing exporters. At present, Peru's share of overall reefer exports is insignificant, but it is still important to bear in mind the country's potential for growth in perishable production.<sup>14</sup>

The main export destination for both of the subregions is Northern Europe. Chile and Brazil, however, are the least dependent on this market. They have higher export shares in Asia and the Far East, regions which are becoming more important, because of the rapid growth of their populations and the increasing demand for perishable goods. The east coast is more dependent on these emerging markets, while the west coast relies more on markets that are closer to home, that is to say, in America.

Section IV put the geographical coverage of world conventional reefer trade into perspective, by outlining the number of conventional reefer calls between 2009 and first half of 2011. The numbers show that South America was the second largest region for conventional reefers.

The most activity takes place on the west coast, with a marginally lower frequency of port calls than Africa. Ecuador has the strongest market presence and highest volume shipped by conventional reefer vessels in South America, but even this market is facing a drop in market shares because of container lines.

As discussed in part III, the container capacity on the principal trade lanes from South America has grown significantly since 2000 and the main destination is Asia. The east coast offers a higher capacity on the Europe trade routes compared to the west coast, while the latter offers a larger capacity to North America. Services from the north coast have the smallest capacity, but have seen a growth in reefer slot shares, particularly on the trade lane to Europe. As described in part A, the supply of reefer plugs for refrigerated containers has grown at a faster rate than that of dry containers.

Perishable goods export markets are competing with each other to offer the highest quality, fastest and most reliable service. Despite the debate over conventional reefer and containerized vessels, both modes are essential for reefer exports and cold chains in South America. They should aim to complement each other rather than compete. This should ensure the flow of the cold chain and improve export competitiveness in the region. Several exporters, freight forwarders and retailers actively offer services using both modes, recognizing the unique characteristics of each type. Market dominating retailers with their own conventional reefer fleet use both types as a strategic tool for flexibility, price reductions and security. When spot rates of liner services reach a certain level and during supply shortages, they operate their own fleet of conventional vessels.

With the opening of the widened Panama Canal in 2015, the capacity of vessels on the west coast is expected to increase. In the future, vessels are expected to be the same size, or perhaps even bigger, as the vessels operating on the east coast today. Will the operators of conventional reefers manage to keep their fleet?

<sup>14</sup> Explained in part C.



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