CONTAINER TRANSPORTATION AT THE BLACK SEA: AN EVALUATION OF THE PORTS IN TURKEY

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ABSTRACT
Ports as one of the most important transport infrastructure serve many types of goods. The density of the cargo at the ports is an important indicator of trade, and hence logistics related activities in the hinterland of the port. According to the intensity of container handling in the Eastern Black Sea region in Turkey is not in the expected level of other regions of Turkey gives ideas about the level of infrastructure, trade and logistic. Within the scope of this study, the current situation of the container port in the Black Sea Region, the container ship lines operating in the region and what cargoes transported in containers are considered. In addition, the container handling volume is estimated for 2035. Reviews including not only Central and Western Black Sea Region in Turkey, but also encompasses the container terminals in other countries bordering the Black Sea. Thus, the Eastern Black Sea Region is highlighted in the geography of the Black Sea.
Keywords: Black Sea, Container, Port, Logistics, Maritime.

ÖZET
Limanlar en önemli ulaştırma alt yapılarından birisi olarak birçok yük türüne hizmet vermektedir. Limanlardaki yükün yoğunluğu, liman hinterlandındaki ticaret ve dolayısıyla lojistik ile ilgili faaliyetlerin önemli bir göstergesidir. TR90 Bölgesi olarak adlandırılan Doğu Karadeniz Bölgesi'ndeki konteyner elleçleme yoğunluğunun Türkiye'nin diğer bölgelerine göre beklenen seviyelerde olmaması, bölge ekonomisi, ticareti ve lojistik alt yapısının düzeyi hakkında fikirler vermektedir. Bu araştırma kapsamında Karadeniz Bölgesinde faaliyet gösteren ve konteyner elleçleyen limanların mevcut durumları, bölgede faaliyet gösteren konteyner gemi hatları ve konteynerlerde taşınan yükün neler olduğu değerlendirilmektedir. Ayrıca yapılacak talep tahmini ile bölge limanlarında elleçlenen konteynerin 2035 yılına yönelik yük potansiyeli öngörülmektedir. Değerlen-

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dirmeler Orta ve Batı Karadeniz, ayrıca Karadeniz'de kıyısı olan diğer ülkelerdeki konteyner terminallerini de kapsamakta, bu sayede Karadeniz coğrafyasında Doğu Karadeniz Bölgesinin yeri vurgulanmaktadır.
Anahtar Kelimeler: Karadeniz, Konteyner, Liman, Lojistik, Denizcilik.

Black Sea Reservoir encompasses extensive and different geographies like The Balkans, Eurasia and Caucasia with its economic, commercial and political characteristics. Considering 6 countries (Russia, Ukraine, Romania, Bulgaria and Georgia) including Turkey that have coast to Black Sea; this region is constituted by 300 million people (United Nations, 2013) who lives in 18.8 kilometers square with total 3.4 trillion dollars Gross National Product -GNP- (as per purchasing parity). Black Sea's commercial and transportation geography encompasses a more extensive area and more countries when Central and East Europe via Balkans and Ukraine, and Central Asia via Khazar and Caucasia included. Turkey's the Black Sea coastal length alone; nearly 1.700km; is longer that many countries' coastal lengths. Turkey barely reflected this massive commercial potential coming from the geography it is in or the coastal length it has to the cargo volume of the Turkish harbours that are in business at Black Sea (Esmer and Oral, 2012).

The most economic and commonly used way of transportation in the world is maritime lines. Countries create a difference with the substructure and superstructure of their ports and legal legislations along with their geographical position. Ports that are closer to, or have a strong liaison with industrial zones come into prominence. In the competition among different countries that offer service in the same region; the economic potential, import and export cargo capacity, agreements with neighbour countries, hinterland connections of the ports, technological sub and superstructures of the countries forms the facts that bring them to the forefront.

At present, the Turkish ports at the Black Sea mostly offer territorial cargo volume like copper, coal, fertilizer, construction products and lumber. However ports at the Black Sea has an important potential for territorial container handling from Eastern Anatolia Region, Southeast Anatolian Region, GAP and Iran with recently started projects like Ovit Tunnel and Freight Villages.

The aim of this research is to evaluate the current situation, container maritime lines and Cargo types of ports that are in business and handling containers within Black Sea Region. This study primarily evaluates the developments of container ports in Black Sea countries and secondarily analyses the current situation of the Turkish ports at Black Sea coasts. Lastly, the cargo demand estimation of container loading and the cargo potential of container handling in the ports of the region are projected for the year 2035.

Developments in Container Ports at Black Sea Countries

The maritime trade worth to a level of 113.5 billion dollars in the Black Sea (Helbing, 2014). When it is studied within the specifics of container ports, it is known that all countries that have coast to the Black Sea are in container terminal business.

In 2013 Black Sea Countries; excluding Turkey; handled 2.7 million TEU containers. 1.8 million TEU (66%) of the containers that are handled were loaded containers (Matteo, 2014). In 2009, with the effect of the global economic crisis, the container handling have significantly dropped but started to recover in 2011 (Figure 1).

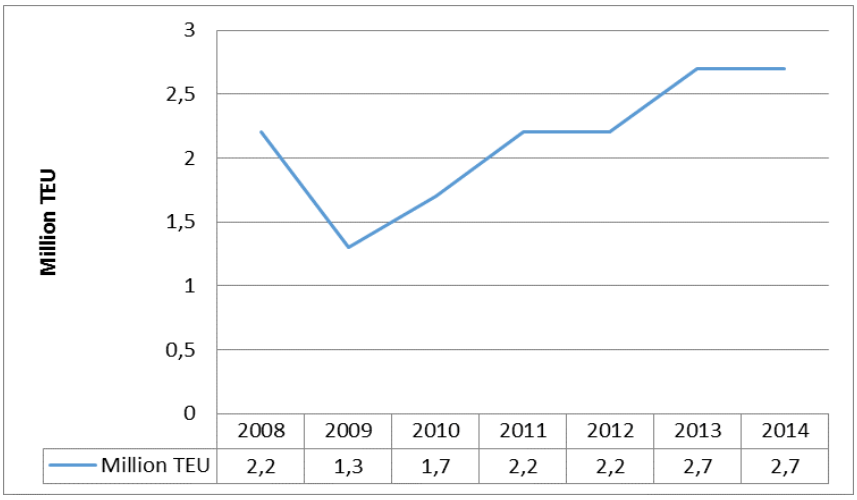

Figure 1. Development of Container Handling at Black Sea (Soy, 2014)

Figure 2. The Ports at Black Sea (Erciyas, 2014 and formed by the author.)

The ports on the Black Sea are presented in Scheme 2. According to 2013 data; Novorossiysk (Russia, 722,716 TEU), Constanza (Romania, 661,124 TEU), Odessa (Ukraine, 505,640 TEU), Poti (Georgis, 331,324 TEU) and Illichyevs (Ukraine, 273,343 TEU) are the top cargo handling ports in terms of cargo handling figures (Containerisation International, 2014). When container handling statistics are analysed by country, we get Figure 3.

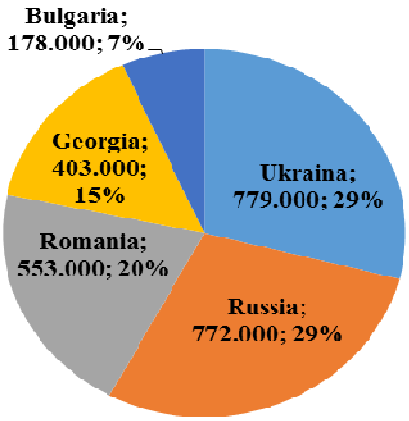

Figure 3. Container Handling Figures and Allocations in Black Sea Countries (2013, TEU, %) (Matteo, 2014)

While Ukraine, Odessa and Illchyevsk ports have the highest portion of 29% at the Black Sea with total handling figures; Russia, Romania, Georgia and Bulgaria follows them. The shares of container ship operators that are in business in 2013 at the Black Sea are reflected in Figure 4.

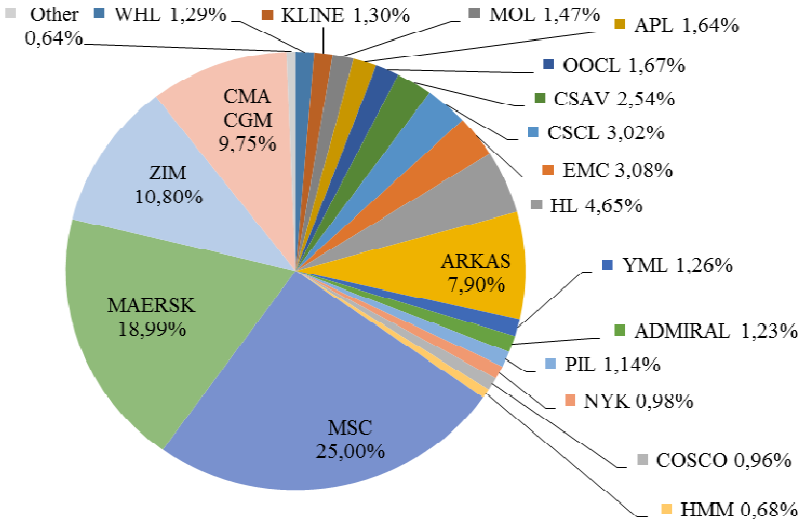

Figure 4. Container Ship Operators at Black Sea (Uğurlu, 2014)

While MSC is the most effective container ship operator with 25% share; Maersk follows it with 19% share. With over 5% share; MSC, Maersk, ZIM, CMA,CGM and Arkas lines fulfil 72% of total Black Sea container transportation (Scheme: 4).

Other current developments in container transportation and port operations at Black Sea countries are listed below (Uğurlu, 2014, Matteo, 2014):

- Modernisation practices continue and many important port investments are planned in most of the ports that are operating at the Black Sea.
- Among these ports Odessa and Illichyevsk of Ukraine, Taman and Novorossiysk of Russia, Samsun, Hopa and Filyos (tender phase with Built Operate Transfer – BOT- model) and Constanza of Romania can be named.
- Global port operators are running Black Sea ports (Hamburg HPA/HPC, CMA CGM, DP World, APM Terminals) and their interest is increasing.
- Important global ship operators started direct services to Black Sea (to COSCO-Varna and Burgaz ports)
- Taman port is becoming one of the most important port of Russia with 1.8 billion dollars investment value.
- At Ilichyevsk (Ukraine) port an important enlargement project has started which is believed to be completed in 2019 and at Odessa port, a new container terminal with 700,000 TEU capacity is planned.
- Constanza port is in the process to extend their storage handling capacities.
- Feeder ship services dominate the Black Sea and these ships usually use Turkish ports as a hub. However, mergers such as Grand Alliance that consist of many container ship operators does weekly container cruises directly from Asia to Constanza and Odessa ports.
- CMA CGM, one of the most important ship operators in the world, has direct services between Asia-Black Sea to Constanza, Ilichyevsk and Odessa ports.

In container transportation, it is an important factor for a container ship operator to include a container terminal to their itinerary. By this, regional cargo can reach the global market more easily and it accelerates the regional commercial development. In this sense, the developments in the Black Sea and interests of globally important container ship and port operators are one of the most important indicators of the regional potential.

Developments in Container Ports Situated At Black Sea Costs

In 2014, cargo movements at ports that handle containers increased 5,3% and reached 8.4 million TEU compared to previous year. Because of the recession in Turkey's economy in 2014, this increase was low compared to previous years (2012: 10.7%, 2013: 9.3%).

Table 1. Container Handling in Turkey (TEU)

PORTS	2012	2013	2014	REGIONS
Marport	1.583.888	1.705.929	1.757.864	Marmara Region
Kumport	1.087.984	1.295.569	1.414.303	
Mardaş	425.592	376.916	315.473	
TDI Tekirdağ	1.627	1.602	784	
Yılport	230.402	305.135	354.410	
Haydarpaşa	161.817	142.744	127.791	
Evyap	400.190	457.537	522.970	
Derince	1.014	1.442	8.358	
Limaş	6.845	46.709	25.694	
Borusan	189.099	218.401	227.064	
Gemport	374.914	331.430	388.589	
Rodaport	130.224	123.713	101.919	
Çelebi Bandırma	9.748	23.547	25.163	
İzmir	705.097	697.026	680.972	Aegean Region
Nemport	279.853	258.275	256.554	
Ege Gübre	149.429	219.469	283.516	
Petkim	257	61	0	
MIP	1.253.803	1.366.823	1.482.774	Mediterranean Region
İskenderun	203	31.189	79.364	
Assan Port	83.400	118.044	106.692	
Port Akdeniz	186.463	217.384	189.337	
Port Bartın	2.245	3	7	Black Sea Region
Port İnebolu	0	678	800	
Trabzon	26.032	20.105	18.039	
Samsunport	27.734	36.671	47.906	
Rize	604	0	0	
Hopa	124	0	0	
Turkey Total	7.318.588	7.996.402	8.416.343	

(Türklim, 2015, UDH Ministry, 2015 and TCDD, 2015.)

In Turkey during 2013, Marmara was the most container handled region with 63% share, followed by Mediterranean Region with 22% and Aegean Region with 15%. Although the amount of containers that were handled in Black Sea Region significantly increased (16%) when compared to previous years, the share of Black Sea Region was 1% with 67

thousand TEU within total containers (Table 1). Meanwhile the main container handling ports at the Black Sea are Samsun Port and Trabzon Alport, the West Black Sea Ports İnebolu and Bartın also performed container handling even if just a little. The fact that the ports in this region mainly handle local cargos and serve limited transit transportation concludes in these ports (Samsun Port and Alport) to be rated low within handling figures among other countries at the Black Sea.

Estimated Cargo Demand for Container Ports at the Black Sea

In this study, regression method was used which analyses relationship among cargo estimations of container handling ports at the Black Sea, past cargo movements of ports in this region and socioeconomic indicators of its hinterland.

Regression analysis estimation method of port traffic is a method that is used to determine the ideal traffic estimation with regression analysis using port traffic statistic data from the past to present in addressed regions.

The primary data that is used for port-related cargo demand estimations are population, Gross Domestic Product, wholesale or consumer price index, personal consumption expenditures, rate of capacity utilisation, feedstock, transportation volume of semi-manufactured and manufactured products, volume and target import and export and regional consumption of basic products (JICA, 1998). While this data is frequently used as independent variables in causal methods, the development history of the cargo is used as dependent variable.

In the regression equation used for estimations within the scope of this study (y=a+bx1+cx2….), the dependent variable (y) is regional cargo traffic, whereas independent variable (x) is socio-economic data like GDP and population of port hinterland (Table 2).

Container handling figures that are taken as dependent variables are obtained from total handling figures of all ports that handle containers in the region. However because of the fact that the handling figures in West Black Sea are very low, results will be intended for Central and East Black Sea Regions. According to regression analysis results, the coefficient of determination value (r^2) and Adjusted R^2 are calculated as 0,96 and 0,92 respectively. It is clear that all data fit in the regression model (ANOVA F: 23,1 sig: ,000).

Cargo demand estimation made in this research targeted the year 2035 and interval estimation was made, not point estimation. Because of this, estimations are expressed as pessimistic, average and optimistic. In the determination of these pessimistic, average and optimistic estimations; the prudential average, low or high-level improvement estimations of socio-economic indicators that Ministry of Development and World Bank determined became effective.

Table 2. Variables Used for Cargo Demand Estimation

	Dep. Variable	**Independent Variable**				
Years	Black Sea Region Container Handling (TEU)	Turkey Container Handling (TEU)	Turkey GDP (prices of 1998 - TL)	Turkey's Import (in USD *000)	Turkey's Export (in USD)	Population (000)
2004	2.765	3.088.813	83.485.590.611	97.539.766	63.167.153	67.599
2005	4.551	3.304.586	90.499.730.897	116.774.151	73.476.408	68.435
2006	5.442	3.822.727	96.738.320.212	139.576.174	85.534.676	69.295
2007	10.345	4.699.529	101.254.625.465	170.062.715	107.271.750	70.158
2008	22.141	5.228.154	101.921.729.924	201.963.574	132.027.196	71.052
2009	21.057	4.520.786	97.003.114.411	140.928.421	102.142.613	72.039
2010	28.892	5.866.585	105.885.643.938	185.544.332	113.883.219	73.142
2011	44.156	6.613.035	115.174.724.189	240.841.676	134.906.869	74.224
2012	56.739	7.320.105	117.625.021.083	236.545.141	152.461.737	75.176
2013	57.457	7.995.185	122.388.466.377	251.649.892	151.786.976	76.055

(TUIK (www.tuik.gov.tr), and Türklim, 2015.)

Research Findings

Results of regression analysis of container estimation data are shown as graphic in Figure 5 and as figures in Table 3.

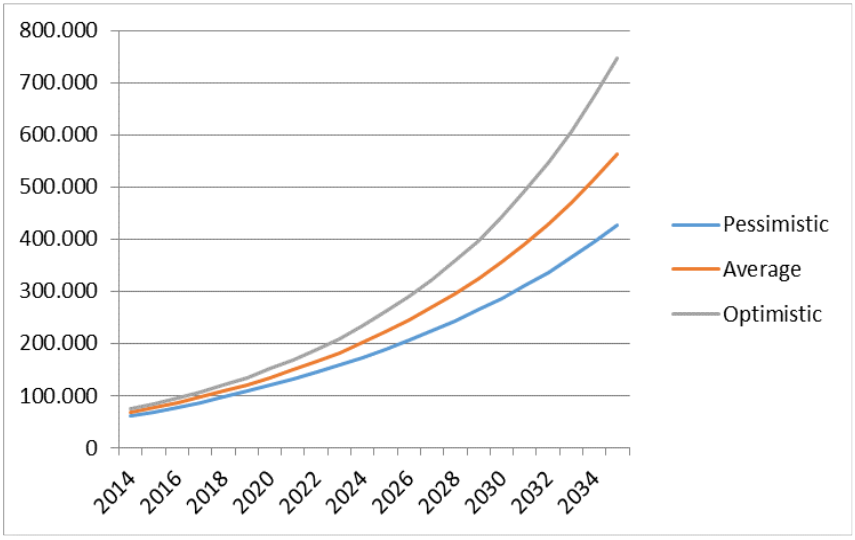

Figure 5. Estimated Container Handling at Black Sea Region (TEU)

By results of demand estimations, with average estimation, the current container handling level of 60 TEU at Black Sea Region in Turkey is predicted to reach 134 thousand in 2020, 221 thousand in 2025 and 356 thousand TEU in 2030. It is foreseen that handling numbers will exceed 500 thousand TEU only after the year 2030's. This development is only possible by gaining share from current transit cargo handled by ports of other countries at the Black Sea and by improving infrastructures of transportation and logistics in posterior areas of the ports at East and Central Black Sea.

Table 3. Estimated Container Handling at Black Sea Region (TEU)

Years	Pessimistic	Average	Optimistic
2020	119.178	134.521	150.784
2025	188.723	221.972	260.154
2030	286.747	356.251	442.595
2035	425.891	563.518	747.664

Conclusion

Ports that reserve an important place in coastal usage demand effects not only the coastal area they are in but also an extensive area formed in their hinterland in a social and economical way. Ports are logistic centers where cargo transportation modes are changed for important transport infrastructure and transhipment is done. In this sense, the cargos that are transported from hinterland are transmitted to world countries. Briefly, the effective and productive operation of the ports influence not only the port but also the economy of the country in broad terms. Considering this, besides Turkish ports at Black Sea coasts are under performing in the means of cargo handling, with future projects and infrastructural investments (road, tunnel, freight village, manufacturing plant etc.) there is a potential to convert the unutilised capacity of the ports to advantage.

On the other hand, when developments in Black Sea countries (container ship and port operators, port and infrastructure investments etc.) are evaluated, an increase in cargo transportation at the Black Sea can be predicted. For Turkish ports to gain high share from these developments, their efficiency in the region must be enhanced. To do so, planning must be done especially in the field of logistics master planning, strategic advantage of the ports such as Samsun (railway connection and port infrastructure), Trabzon and Hopa (location and project cargo potentials) must be evaluated thoroughly. Eastern Black Sea ports' potential to play an active part in transit transportation to Caucasia, Central Asia and the Middle East must be considered.

Turkey's trade with Central Asia and Caucasia is expected to be improved by finalizing current Baku – Tbilisi - Kars Project and implementing Hopa – Batumi Railway Project which is in the planning phase. This study can be supported with another study which analyses the estimated increase

in trade by above mentioned railway projects and the role of Black Sea ports to this increase.

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