Effect of Silk Road Railway on International Trade:

An Analysis of the Turkish Case

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EFFECT OF SILK ROAD RAILWAY ON INTERNATIONAL TRADE:

AN ANALYSIS OF THE TURKISH CASE

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DECLARATION OF ORIGINALITY

I, Ghina Karazi, certify that

- I am the sole author of this thesis and that I have fully acknowledged and documented in my thesis all sources of ideas and words, including digital resources, which have been produced or published by another person or institution;
- this thesis contains no material that has been submitted or accepted for a degree or diploma in any other educational institution;
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ABSTRACT

Effect of Silk Road Railway on International Trade:

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For long centuries, Silk Roads were always a point of interest for kings and states. Even for modern government, Silk Roads are always seen as trade boosters. In the past few years, Baku-Tbilisi-Kars (BTK) Silk Road has been a hot topic for its partner countries. Huge budgets were planned for investment with the aim of expanding the international trade drastically. As several stages of BTK Silk Road have been accomplished, big planned projects are still going on or yet to be launched. With the continuous spending along with big promises a need for progress check arises. In this study, trade indices for Turkey have been collected for the past 19 years. The indices included international imports, exports, total trade, trade of specific product categories, and trade with the specific BTK partners: Georgia, Azerbaijan, and China. The data was analyzed using regression test on SPSS and MS Excel. The regression was generally between the Turkish railway capacity (ton-km) and trade volume (1000$). Most of the hypothesis were found to be statistically significant and showed that railway capacity had positive effect on the trade volume. Moreover, some of the accepted hypothesis could potentially explain certain observations in the Turkish trade. The study had several limitations such as working with limited data points, testing the effect of BTK that has recently started operating, and as trade volume was measured in US dollars, the inflation in exchange rate was not put into consideration.

ÖZET

İpek Yolu Demiryolunun Uluslararası Ticarete Etkisi:

Türkiye Örneğinin Analizi

Yüzyıllar boyunca İpek Yolu kralların ve devletlerin ilgi odağı olmuştur. Günümüz devletleri için bile İpek Yolları ticaret kaldıracı olarak görülmektedir. Son birkaç yıldır Bakü-Tiflis-Kars (BTK) İpek Yolu, ortak ülkeler için önemli bir konu olmuştur. Uluslararası ticareti önemli ölçüde genişletmek amacıyla yatırım için büyük bütçeler planlanmıştır. BTK İpek Yolu'nun bazı etapları tamamlanmıştır ancak büyük planlı projeler hala devam etmekte veya henüz başlamamıştır. Bu büyük yatırım için yapılan harcamalar ve vaatlerle birlikte kontrolü ilerleme ihtiyacı da ortaya çıkmaktadır. Bu çalışmada, son 19 yıl için Türkiye ticaret endeksleri toplanmıştır. Endeksler, ithalat, ihracat, toplam uluslararası ticaret, belirli ürün kategorilerinin ticareti ve BTK ortakları olan Gürcistan, Azerbaycan ve Çin ile ticareti içermektedir. Veriler SPSS ve MS Excel üzerinde regresyon testi kullanılarak analiz edilmiştir. Türkiye demiryolu kapasitesi (ton-km) ile ticaret hacmi (1000$) arasında anlamlı ilişki tespit edilmiştir. Hipotezlerin çoğu istatistiksel olarak anlamlıdır ve sonuçlar demiryolu kapasitesinin ticaret hacmi üzerinde olumlu etkisi olduğunu göstermektedir. Ayrıca, kabul edilen bazı hipotezler, potansiyel olarak Türk ticaretindeki bazı gözlemleri de açıklamaktadır. Çalışmanın sınırlı sayıda veri ie yapılması, BTK'nın yeni faaliyete geçen bir yatırım oluşu, ticaret hacminin ABD doları cinsinden ölçülmesi nedeniyle döviz kurundaki enflasyonun yüksek olması gibi çeşitli sınırlılıkları bulunmaktadır.

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CHAPTER 1

INTRODUCTION

As the Chinese President Xi Jinping announced the proposal of The Silk Road Economic Belt and the 21st century Maritime Silk Road initiative in autumn of 2013, with a completion date due 2049 (Kaplan, 2018), huge budgets have been planned by different countries including Turkey (Daily Sabah, 2020). Kaplan (2018) also mentions how the initiative is promising huge trade benefits to all the participating countries. Today, years after the proposal of the initiative, with major stages being completed, this study aims to observe the effects of the Turkish Silk Road railway routes capacities on the trade indices for Turkey and three of her Silk Road partners: China, Georgia and Azerbaijan. The study focuses on overall trade in Turkey, and its trade between the chosen three Silk Road partners, with the goal of giving insights on where the railway trade in Turkey is standing today and how has it been changing from the years 2001 till 2019.

The study is mainly composed of six classic chapters. The first one is this specific introduction for the study. Then, Chapter 2 includes a literature review of the Silk Road history, maps, projects, and effects. Chapter 3 tackles the theoretical approach with its hypothesis. Next, in Chapter 4, the methodology is explained regarding data collection and analysis. Later, Chapter 5 has detailed analysis for the obtained results of the regression tests made. Finally, in Chapter 6, the results and findings are discussed and research limitations are briefly specified and explained.

CHAPTER 2

LITERATURE REVIEW

This chapter provides the literature review for the study. First history of Silk Road is presented followed by a detailed review of the current One Belt One Road initiative. Discussion of routes and corridors and the effects of this initiative on global trade with a focus on Turkey follows.

2.1 Ancient silk road history

According to Kundu, Yulek and Humbatov (2014), interaction between Asia and Europe on land ways began in the 2nd century, during the Han Dynasty in China. Later on, the primary channel on this land route was named the Silk Road, as it was used to carry lightly weighted but valuable goods from Asia into Europe, and the main item of trade was the 'silk'. Historically, the Silk Road refers to the ancient trade and cultural routes that emerged during the 2nd century BC between China and South and Central Asia, Europe and the Middle East, as mentioned by Asltola and Kapyla (2016). It goes back to the ancient caravan road that stretched on thousands of kilometers, East to West, and that was used to transport silk, paper, jewels, spices, and was even a way to exchange cultural ties and traditions between different continents.

Since traditional time, Anatolia had been a bridge connecting the East with the West, because of its geographic location. During the Middle Ages, in order to reach Europe from the sea, the ports of Alanya and Antalya were used, and in the Black Sea region, the ports of Trabzon and Sinop were used, and in the Aegean coast, the ports of Ephesus and Miletus. Back then, the Silk Road had been stretching

between Central Asia to Anatolia, and from Thrace to Europe; and the location and different Anatolian ports have definitely made Anatolia a turning point of the Silk Road, according to UNESCO.

The Silk Road in Anatolia stretched in the North on: Trabzon, Gümüşhane, Erzurum, Sivas, Tokat, Amasya, Kastamonu, Adapazarı, Izmit, Istanbul and Edirne; In the South, it passed on: Mardin, Diyarbakır, Adıyaman, Malatya, Kahramanmaraş, Kayseri, Nevşehir, Aksaray, Konya, Isparta, Denizli, Antalya. Meanwhile, Erzurum, Malatya, Kayseri, Ankara, Bilecik, Bursa, İznik, İzmit, İstanbul were other used routes.

2.2 Beginning to 2015

The Silk Road Economic Belt and the 21st Century Maritime Silk Road initiatives, collectively known as the "One Belt, One Road" initiative, (referred to as OBOR), were proposed in autumn 2013 by the Chinese President Xi Jinping, with a completion date due by 2049 according to Kaplan (2018), envisioning a revival of the Ancient Silk Road. Casarini (2015), mentions that the 'One Belt, One Road' initiative is China's largest diplomatic project in decades. Asltola and Kapyla (2016) quote President Xi's speech in which he said that this initiative would cover a massive area that "represents the biggest market in the world with unparalleled potential". In Chinese, the first part of the phrase defining this initiative refers to the construction of a Silk Road economic belt which spreads from inland and western China to Central Asia and towards Europe, and the second part of the phrase refers to the idea of a 21st century maritime Silk Road, which is inspired by the ancient maritime trading routes from coastal China through the South China Sea and further beyond, as mentioned by Summers (2015). Summers (2015) notifies that the project

aims to extend those routes into countries and continents that currently have small but increasing trade volumes, like the case in East Africa. The initiative covers 55 percent of the world GNP, 70 percent of the world's population and 75 percent of the world's known energy reserves (Casarini, 2015).

It is important to note that later in 2015, the OBOR initiative's name has been changed to "BRI" referring to "Belt and Road Initiative", as the name was misleading in its literal translation to the English language. Summers (2015) mentions that the phrase 'one belt one road' in English is 'clunky and somewhat misleading' because it is just the literal translation of a Chinese phrase 'yi day yi lu' which is a condensation of the two main phrases explained earlier. Summers (2015) also says that, despite the name, the initiative on the other hand is absolutely not about singular routes, instead it is actually about multiple routes, as shown in Figure 1 and Figure 2, that are aimed to reach multiple locations enhancing connectivity in terms of trade, finance, flows of humans, and investment. In this research, the initiative will be referred to as OBOR.

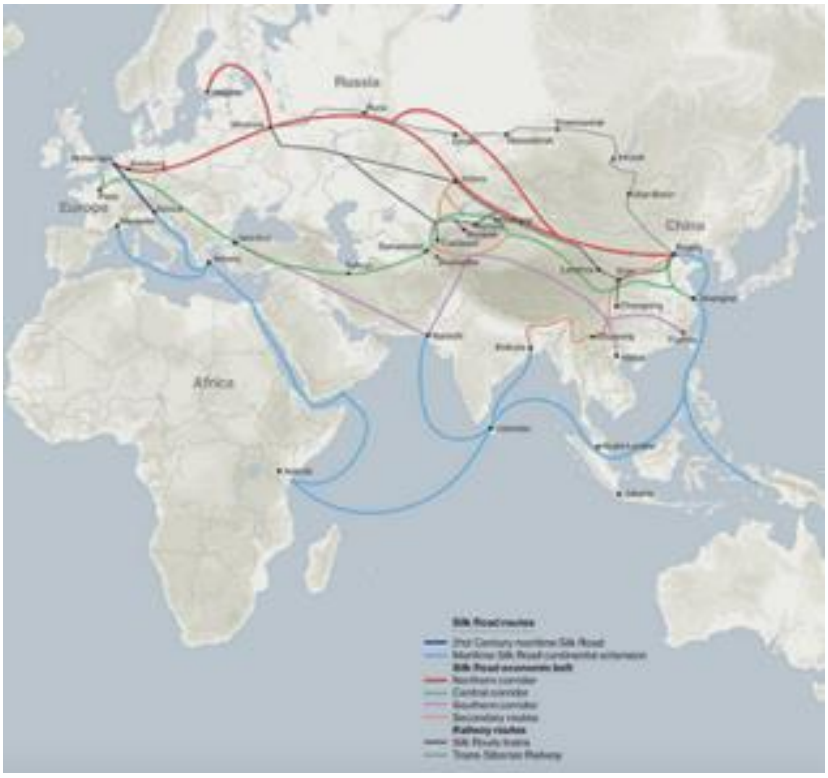

Fig. 1 Map showing various silk road routes

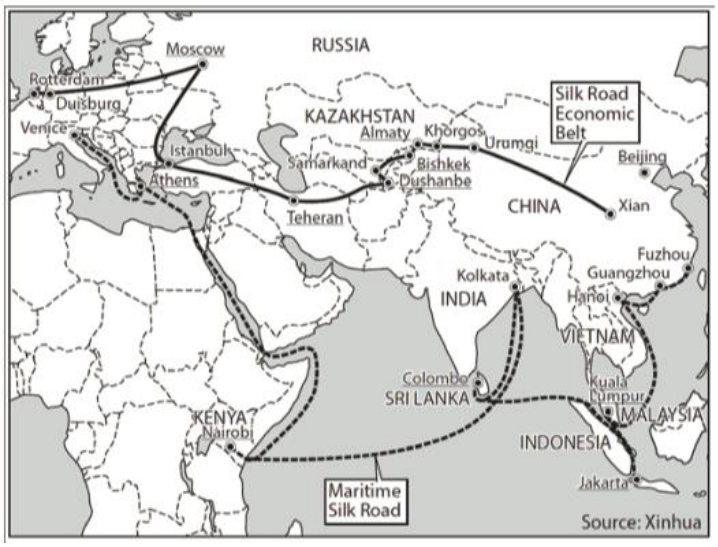

Fig. 2 Chinese silk roads (Kaplan, 2018)

2.3 Goals of the OBOR initiative

A declared goal of this grand initiative is to enhance connectivity and trade between China and 65 other countries, where China is likely to commit to almost $300 billion in loans for financing trade and infrastructure, as noted by Casarini (2015). Moreover, Kaplan (2018) mentions that the Office of the Leading Group for the Belt and Road Initiative (2017) states that one of the goals of the initiative is "to maintain an open world economic system by building a more balanced, equal and sustainable trade system which benefits all participating countries". Later in 2015, the "Vision and Actions on Jointly Building 'One Belt, One Road'" was released, the Asian Infrastructure Investment Bank (AIIB) was created, and the Silk Road Fund was established, all focused on moving the OBOR into the stage of implementation. As indicated in the Vision and Actions, the OBOR focuses on "connecting the vibrant East Asia economic circle at one end and the developed European economic circle at the other end" as a vision to revive the historical Silk Road.

According to Asltola and Kapyla (2016), the proposed initiative emphasizes increasing policy communications which would help joint economic cooperation, developing transportation networks to enhance intra- and intercontinental trade, and facilitating trade relations by removing trade barriers and decreasing trade and investment costs. The initiative also sheds light on decreasing financial risks and enhancing cultural relationships between the participating countries, for example by offering government scholarships, study tours and other cultural events. The creation of the OBOR initiative has been a very debatable topic. According to Lin (2015), the OBOR is an initiative projecting China's opening-up strategies responding to the changes in domestic and international circumstances. Li, Bolton, and Westphal, (2018) discuss that if the goals of the OBOR are actually realized, it will dramatically

affect China and Europe and “will become a propeller for hinterland development”. Kaplan (2018) mentions that it is an exceptional property of the new Silk Road how the countries participating in it are in different developmental states, varying from low to high income countries; thus, if it is to be successful, welfare of the participating countries at different levels of development will increase, and they will benefit from the initiative.

2.4 Routes and corridors

The OBOR initiative is made up of five routes and six corridors, shown in Figure 3. Kaplan (2018) roughly explains about them: The Silk Road Economic Belt has three major routes, with one extending from Northwest China and Northeast China to Europe and the Baltic Sea via Central Asia and Russia; the second from Northwest China to the Persian Gulf and the Mediterranean Sea passing through Central Asia and West Asia, and the third one from Southwest China through the Indochina Peninsula reaching the Indian Ocean. Furthermore, the 21st century Maritime Silk Road has two major routes, one starts from the coastal ports of China, crosses the South China Sea, passes through the Malacca Strait, and reaches the Indian Ocean, reaching out to Europe; the other route starts from coastal ports of China, crosses over the South China Sea and reaches out to the South Pacific. The six corridors are: the New Eurasian Land Bridge Economic Corridor (China, Kazakhstan, Russia, Belarus, Poland Germany), the China-Mongolia Russia Economic Corridor (China, Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan, Turkmenistan, Iran, Turkey), the China-Indochina Peninsula Economic Corridor (China, Myanmar, Cambodia,

Vietnam, Laos, Malaysia, Thailand), the China-Pakistan Economic Corridor, and the Bangladesh-China-India-Myanmar Economic Corridor.

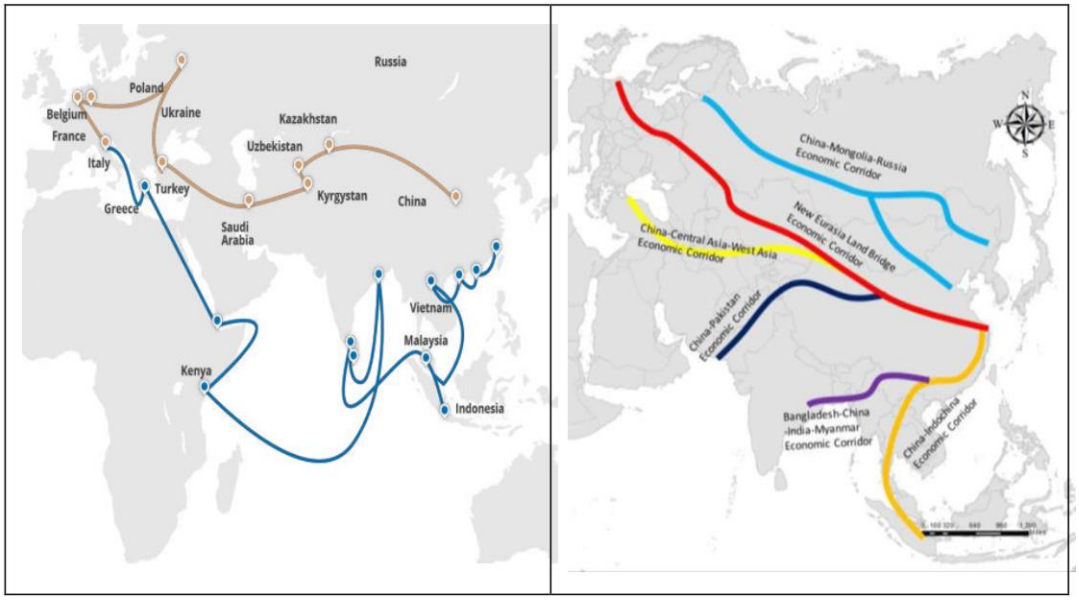

Fig. 3 The new silk road and economic corridors within the BRI countries (Kaplan, 2018)

2.5 Expected effects of silk road railways on trade

Until the year 2016, a lot of research has been made discussing OBOR, but the actual potential effect on the trade between China and Europe had been still waiting on some answers, because it had been a recent project, so many of the big important projects had not been implemented yet. Konings (2018) says that it is expected of the initiative to have huge impacts on China's future development and its relationships with many countries in Asia, Africa, and Europe and that the establishment of the New Silk Road would increase transportation connections between Europe and Asia which would thus have significant implications on international trade.

Konings (2018) also mentions that reducing trade costs between the countries participating in the New Silk Road might increase world trade by almost 12 percent. Furthermore, Li, Bolton, and Westphal (2018) have done a systematic study of nine

Chinese-European trains that were already operating back then and created a pilot study that discusses the effect of these Silk Road Railways on trade between China and its partners in Europe and Central Asia, as a beginning point to evaluate the effect of the OBOR initiative on trade between China and Europe. Li, Bolton, and Westphal, (2018) mention that, it is an old-habit to use railroads in order to ship products from a place to another, used since the Historical Silk Road was created; however, the New Silk Road railways are completely new and they have a great potential because they are occurring in today's world of globalization, also connected through the Internet, thus giving a chance to "real transportation revolution".

Li, Bolton, and Westphal, (2018) use data from the Hong Kong Trade Development Council report (2015), in order to show how international railways have reduced the shipping time needed to a great extent compared to ocean shipping, and actually compared to air shipping, the intercontinental railways have dramatically reduced transportation costs by 40 percent. Furthermore, in comparison to road networks, railway networks were in fact 50 percent more productive in enhancing international trade. Furthermore, Li, Bolton, and Westphal, (2018) use a gravity model and deduce that the railways of the New Silk Road enhance bilateral trade between China and the countries located alongside the railway line. Their study reflects that railways' connections have actually a positive effect on China's exports with its trading partners in Europe and Central Asia. The authors further mention that there is innovation behind the concept of the New Silk Road by rail, since it is an entirely connected and integrated approach to connect China with Europe using railway networks that might increase trade through the reduction of transport costs.

2.6 From 2016 till 2020

In the period post 2016, the effects of the OBOR initiative started to be significantly observed for China and the international trade in general.

2.6.1 Specific effects for China (2016- 2020)

According to Holslag (2017), it is expected that the New Silk Road might lead to better coordination between Chinese stakeholders, as Chinese companies need to work together closely for the national interests, along their entire supply chain. Holslag (2017) also mentions that the 20,000 km of new railways under the New Silk Road, are capable of creating demand for as much as 85 million tons of steel and suggests diversifying exports to countries such as Iran, Turkey, Saudi Arabia and Vietnam. The author also states that another component in the agenda of the New Silk Road is to expand the market share of China in products that fall under the category of high-end goods, which falls under industries like shipbuilding, electricity, renewable energy, advanced machinery, etc.

Holslag (2017) also mentions that the New Silk Road might aspire to make China one the "most competitive high-tech manufacturers" and to explain more about the New Silk Road vision for China, the author states that the Vice-President of the China Communications Construction Company (CCCC) considered the New Silk Road as "the launch of a new 'going out'". Moreover, Holslag (2017) talks about how the New Silk Road would also give China more willingness to trade in more than just goods and include investments, services, intellectual property, engineering, etc. Moreover, Kaplan (2018) talks about the New Silk Road effects on China and stresses that the New Silk Road would probably have important effects on China's economy, as it will decrease bottlenecks in European connectivity through

enhancing infrastructure, and it will help China enhance its economic relations with Europe. Moreover, to understand more the probable effects of the New Silk Road on China, Kaplan (2018) shows that according to Eurostat statistics, China's share in EU's trade increased significantly from the year 2002 till 2017, as shown in Figure 4. Since the year 2017, China has become EU's largest trading partner for imports and second largest for EU exports. Golley and Ingle (2018) further talk about the BRI impacts on China, where the initiative's goal for China is to sustain its economic development and solve the issue of over-production - which is a problem for a number of Chinese industries like coal, cement and steel. BRI's goal is to solve this problem and increase Chinese economic growth by allowing it to cultivate into new markets and new destinations for investment.

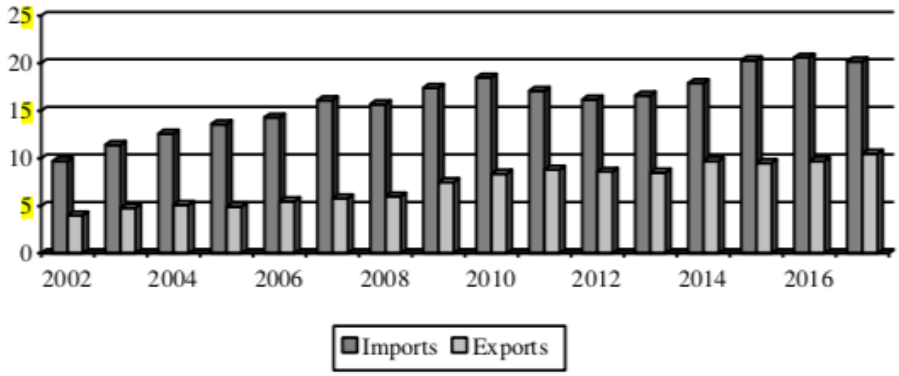

Fig. 4 EU's trade with China 2002 – 2017 (% of total exports and imports) (Kaplan, 2018)

Golley and Ingle (2018) remark as well that the BRI will allow for opportunities for growth in the global economy and bring economic stability as well to less-developed western regions in China, integrating them into the Chinese economy. For example, transporting the region of Xinjiang into an "energy corridor" for Eurasia and take advantage of its untouched resources. Golley and Ingle (2018) also project some other goals of the BRI that might take place in China, including

helping to reduce ethnic tensions in some areas where shared prosperity will take place and turn sporadic violence that has been in some regions since years, into calm and peace. Hu, Liu, and Yan (2017) mention that because China is the world's biggest commodity trading country in the world, with 90 percent of its exports and imports done through sea transportation, but because ocean transportation is actually much slower than rail transportation, is it thus essential for China to depend more on rail transportation than ocean transportation, which can also have positive effects for European countries.

2.6.2 Global effects on world trade (2016- 2020)

Kaplan (2018) mentions that the New Silk Road is presently considered to have the potential of reshaping the entire world global trade, but of course, it is an extremely large project and many years may be needed to study its potential impacts, making it extremely crucial to study its effects on global and regional trade. The author acknowledges that enhances in transportation routes has been among the most important factors that shaped world trade and that maritime routes have always been necessary transportation networks linking the whole world, East to West and South to North, carrying a huge share of goods traded between the EU and China specifically, because of its low container cost.

Kaplan (2018) further discusses that the trade volume between Europe and Asia has been increasing in a fast manner in recent years, with the evolution of new economies in Asia and China being a trigger for this growth. She mentions that a major percentage of Asian exports are sent to Europe and Asia's imports come basically from Europe and Asia, reflecting the growth in the international trade for Asia. Kaplan (2018) thus deduces that the OBOR initiative is likely to enhance the

connection between Asia and Europe socially and economically as well as enhancing connections of intraregional trade on different routes.

Kaplan (2018) further indicates that according to Amighini (2017), the New Silk Road will give the participating countries access to trade via two major channels. The first being through the increase in ties between partners who already depend on trade between one another; and the second being through the creation of new trade routes that will give isolated countries new opportunities and potential to form trade ties. Figure 5 shows that for regions involved in the New Silk Road, global exports have increased over the past years. Kaplan (2018) further notifies how EU imports of products from China have increased in a huge amount from the years 2007 till 2017, as shown by Figure 6.

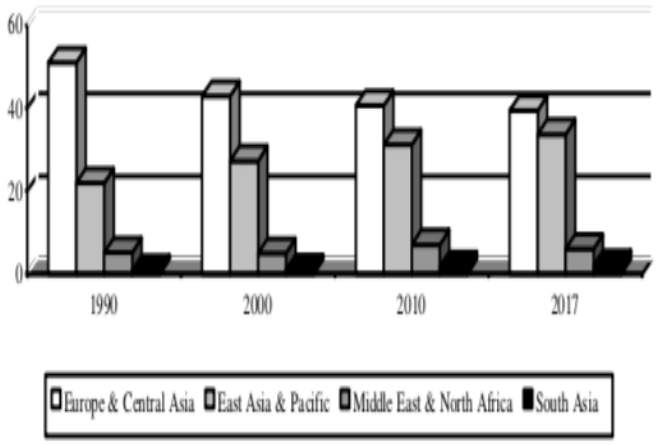

Fig. 5 Share of new silk road economies' merchandise exports in global exports (%) (retrieved from World Bank)

Fig. 6 EU's trade with China, 2007 – 2017 (EUR billion) (retrieved from European Union, Trade in Goods with China (2018))

Furthermore, major changes were projected to take place along the participating countries falling under the name "Five Connectivities": policy dialogue, infrastructure connectivity, tariff reductions, financial support, and people-to-people exchanges, according to Golley and Ingle (2018). Golley and Ingle (2018) also mention that according to the Chinese President Xi, global objectives of BRI include prosperity, openness, peace, cooperation, mutual benefit and inclusiveness to the participating countries. President Xi also aimed to creating a space that will "facilitate opening up and development; establish a fair, equitable, and transparent system of international trade and investment rules, and facilitate the orderly flow and allocation of resources such as labor, capital and energy, as well as full market integration".

In terms of the global projections of the BRI, Golley and Ingle (2018), mention that in the Belt and Road Forum that took place in Beijing, with more than 1,500 delegates from over 130 nations attended, in which the President of China Mr. Xi discussed how the BRI is " China's $1 trillion plan to shake the economic order" and explained how he is aiming to create a new kind of globalization and refashion the global economic order by bringing countries and different companies closer to

China's orbit, and how this new kind of globalization will change the rules of Western institutions.

In order to dig deeper into the potential trade effects of the OBOR on the countries involved in the initiative, Baniya, Rocha, and Ruta (2019) use geo-referenced data and geographical information system analysis in order to calculate the bilateral time to trade before and after the initiative, on the 71 countries potentially involved in it, and then go further in their analysis in order to quantify the probable trade effects of the initiative. Baniya, Rocha, and Ruta (2019) conclude that the Belt and Road Initiative increases trade among participating countries by up to 4.1 percent.

2.6.3 Specific effects for Turkey (2016- 2020)

According to Putten, Montesano, Ven, and Ham (2016), a 'Strategic Relationship of Cooperation' between China and Turkey have started in October of 2010, where eight cooperation agreements have been signed and aimed to increase trade to US$50 billion in 2010 and up to US$100 billion by 2020. Up until 2015, trade volumes between the two have reached US$27.3 billion in 2015, thus it had still been below the target yet increased by almost 12 percent since the year 2011. The authors also mention that China and Turkey have signed an MoU (A memorandum of understanding) on the 'harmonization of the Silk Road Economic Belt and the 21st Century Maritime Silk Road with the Middle Corridor Initiative' and also a 'railroad cooperation agreement'.

Putten, Montesano, Ven, and Ham (2016) further analyze the role and interests of Turkey in China's OBOR vision, and state that one of the major projects in the OBOR initiative include Ankara's ambitious infrastructure program, that

especially emphasizes on railroads. The first step towards that mission was the construction of Istanbul-Ankara high-speed railway, where the finishing of this railways had been essential for Turkey to launch the 'Middle Corridor Initiative' located on the Baku-Tbilisi-Kars (BTK) railroad.

According to the Republic of Turkey, the Middle Corridor begins in Turkey, crosses over the Caspian Sea, into Central Asia and reaches China, and it is one of the main corridors that would revive the ancient Silk Road. Moreover, according to the Republic of Turkey, the importance of this Middle Corridor is basically because of how it is more economical and faster in comparison to the Northern Corridor as a route between Europe and Asia. Putten, Montesano, Ven, and Ham (2016) further mention that an important cooperation between China and Turkey had been the construction of the Baku-Tbilisi-Kars railway, and also in addition to this development in rail infrastructure, OBOR have increased economic related engagement in Turkey in other areas. For example, in September 2015, the Kumport container terminal, Turkey's third largest port, had been acquired by a Chinese consortium (consisting of COSCO, China Merchants, Holdings and CIC). Morever, in May 2016, Bank of China became the second biggest Chinese lender to be allowed access to the Turkish market with an initial capital of US$300 million. Also, DHL, a leading company in air, sea and road freight services in Asia and Europe, inaugurated its China-Turkey corridor as part of OBOR.

Putten, Montesano, Ven, and Ham (2016) further continue analyzing OBOR possible effects on Turkey, and mention that integrating with the OBOR initiative can provide Ankara with huge economic dividends which might stabilize the currently changing economic situation and participating in OBOR's initiative can give the country access to growing development banks and funds and might thus give

Turkey an opportunity to upgrade significant parts in its infrastructure and production facilities. The authors conform to the idea that because OBOR is an initiative that concentrates on enhancing infrastructure, in specific railways, it would be particularly important for Turkey, because it would introduce new high-speed lines in Turkey, and it would help Turkey reach export markets in Central Asia and even further East.

In addition, Putten, Montesano, Ven, and Ham (2016) mention that, this advantage in particular, might be of special importance for Ankara's trade economy, since war in Syria and Iraq, disagreements in Iran and problems in Egypt have hindered its easy access to export routes to the Middle East. Putten, Montesano, Ven, and Ham (2016) say that trade could be Turkey's most important benefit from OBOR and would allow Turkey to achieve ambitious goals related to trade like becoming in the top ten world economies in 2023 and might give it an opportunity to reform its economy. Furthermore, according to the Republic of Turkey, Turkey is going through a series of projects in order to revive the historical Silk Road. Important infrastructure initiatives were completed like "Marmaray" undersea rail project, the Eurasia Runnel Project finished on 20 December 2016, Yavuz Sultan Selim Bridge in Istanbul completed on 26 August 2016, and Istanbul airport introduced on 29 October 2018.

In addition to the projects already inaugurated, there are many projects still ongoing, aiming to enhance interconnectivity within the region, for example, the Three-Levels Tube Tunnel Project in Istanbul, Canakkale Strait Bridge project, Edirne-Kars High Speed Rail project, and even other ports like Mersin and Filyos. In addition, Putten, Montesano, Ven, and Ham (2016) mention that Turkey suffers from a huge trade deficit with China by comparing 2014's exports of $2.9 billion to

imports of $24.9 billion and suggest that OBOR might give Turkey the chance to decrease or even out this imbalance since OBOR will give Ankara the chance to manage and improve its logistical capabilities and infrastructure.

2.7 Baku-Tbilisi-Kars railroad

Kundu, Yulek and Humbatov (2014) notify how the BTK railroad is actually known as the "Iron Ground for the Silk Road" and state that the idea of this railroad is to enhance linkages between the countries involved and to increase regional integration and increase the likelihoods of developing trade and economic relationships. Figure 7 shows a map of the Baku-Tbilisi-Kars railroad. This research gives insights on the significance behind the BTK railroad and mentions how it enhances tourism, allows for easy access between the countries involved in a cheaper mode of transportation, and thus increases overall connectivity within the regions.

As mentioned earlier, the Middle Corridor is located on the Baku-Tbilisi-Kars railroad, which was inaugurated on 30 October 2017. The BTK has an initial capacity of 1 million passengers and 6.5 million tons of cargo, and expectations say

Fig. 7 Baku-Tbilisi-Kars route map (republic of Turkey)

that it is meant to increase to 3 million passengers and 17 million tons of cargo by 2034, thus revolutionizing trade between China and Europe.

As mentioned by Kundu, Yulek and Humbatov (2014), it had been predicted by some analysts that by the year 2030 a tourist might have the chance to take a high-speed train located in Istanbul and arrive in Baku on the same day, and even take a bus tour in Tbilisi. Later, the tourist might have a chance to take a ferry to Turkmenbashy, and from there take another high-speed train and reach Urumqi in China's Xingjian region. The significance of this prediction is to show how in the not-so-far future, the whole region of central Eurasia will include a highly developed and connected infrastructure of highways that will allow for the easy and fast transfer of people and cargoes between Europe and Asia.

Kundu, Yulek and Humbatov (2014) also mention the expected effect of the BTK on Cargo transport in Turkey, Azerbaijan and Georgia, shown in Figure 8.

	Billion ton – km		
	Turkey	**Georgia**	**Azerbaijan**
2013	20	14	22
With BTK (in the first phase)	28	24	27
With BTK (2034)	45	40	44

Source: *UIC, CIA Factbook, TCDD (Demiryolu ile Yuk Tasımacılıgı, ASO Yayın Organı, Mayıs/ Haziran 2012)*

Fig. 8 The expected effect of the BTK on the cargo transport of Turkey, Azerbaijan, and Georgia

Kundu, Yulek and Humbatov (2014) talk about the regional and global benefits of the project. In short, they mention how for Azerbaijan the BTK will provide another means of transferring local products into Europe, provide income generated from the fares of the transit and even allow the whole country to develop and expand as a regional transportation center. Kundu, Yulek and Humbatov (2014) also mention how for Georgia, the BTK will link the country to Europe though an

important railway, as for now, the only connection from Georgia to Europe is through Russia, and like Azerbaijan, become a transportation center for the region. With respect to Turkey, Kundu, Yulek and Humbatov (2014) note that the BTK's importance is underlined in the strength it will provide Turkey in its position within the transportation corridors in Asia and Europe, it will give Turkey access to Russia through Tbilisi, and it will give Turkey the chance to form connections and enter Central Asian countries, especially the Turkish speaking ones. Furthermore, Kundu, Yulek and Humbatov (2014) mention how it had been forecasted that transport between Turkey and Georgia might increase by 4.75 million tons by the year 2036.

Kundu, Yulek and Humbatov (2014) further mention that the benefits of the BTK are not only for the 3 countries directly involved in the project, but the project would also benefit regions that are currently problematic like Akhalkalaki and give it a chance to boost its economy and even might fix internal problems in other countries.

2.8 Infrastructure

Li, Bolton, and Westphal (2018) mention that investing in infrastructure of the railway networks and improving it can be a trigger that enhances productivity, allows for increases in economic growth and even diminish poverty for the countries and areas along the "Silk Road Economic Belt". Also, Baniya, Rocha and Ruta (2019) conclude from their study that the Belt and Road Initiative would increase trade flows among the countries participating in it by 4.1 percent, as mentioned earlier, and that actually those effects are likely to be, on average, three times larger if upgrades in infrastructure took place alongside as well and were complementary to the policy

reformations. They also deduce that the countries that employs new infrastructure can benefit more from trade gains.

Baniya, Rocha and Ruta (2019) further mention how improvements in infrastructure that facilitates trade like improving the rail or ports infrastructure can have positive effects on exports, and those improvements specifically are highly important in the case of the Belt and Road Initiative. For example, China's growth in trade and its growth in need for energy supplies is an incentive for it to invest more in infrastructure.

Furthermore, Aaltola and Kapyla (2016) mention that in Central and South Asia, developments in infrastructure were suggested in order to enhance trans-regional connectivity and increase economic activity in the region. An essential part of the suggestion was to focus on the construction and elongation of hard infrastructure, and several infrastructure projects were identified in order to be pursued in the region. The proposals included suggestions to develop the energy transmitting networks, roads, railways, energy pipelines, and information networks.

There had also been suggestions to improve the soft infrastructure that would help in the free flow of goods, services and people. Aaltola and Kapyla (2016) also note that developing infrastructure, financial cooperation and policy communication are the most essential tools for the Silk Road Initiative. In order to highlight more the importance of investing in the development of infrastructure, Aaltola and Kapyla (2016) further mention how China have financed projects that would enhance infrastructure development and had even announced a $40 billion Silk Road Fund in order to fund the needed infrastructure along the Silk Road. Kundu, Yulek and Humbatov (2014) recommend that in order for the BTK project to take its full potential and become an essential part of the international railway network, it is very

important that the existing railway networks in Turkey, Azerbaijan and Georgia to be upgraded. This of course will be costly, but it will allow the project to give its full benefit and thus the costs would be covered.

2.9 Imports and exports of Turkey

Since the year 2000, the economic performance of Turkey has been impressive, as employment have increased, incomes have raised and Turkey has become an upper-middle-income country and has also opened up to foreign trade and finance, as mentioned in World Bank (2020). Daily Sabah (2020) also notes how Turkey had actually aimed at $190 billion worth of exports in 2020, as said by the head of the Turkish Exporter's Assembly (TIM). Moreover, Daily Sabah (2020) explains how despite several struggles, Turkey's exports have reached a new record in 2019, where exports crossed $180.46 billion. Furthermore, imports have decreased by 8.99%, and reached $210.4 billion, and the country's foreign trade deficit have decreased from $54.3 billion to $29.9 billion. Daily Sabah (2020), further mentions how foreign trade in Turkey has reached a new record, contributing the country's growth by 4.7 points, which is the highest contribution observed for 18 years in Turkey.

Moreover, according to the Foreign Trade Statistics (2020), in reference to the data produced in cooperation with the Turkish Statistical Institute and the Ministry of Trade, exports in October 2020 were $17,329,000,000 which shows an increase of 5.9% in comparison with October 2019; and imports in October 2020 were $19,703,000,000 which shows an increase of 8.4% in comparison with October 2019.

According to the Republic of Turkey, main export items from Turkey include marble and travertine, lead, iron, chromium, copper natural borate ores, boric oxide

and bodice acid. And the main import items to Turkey include wireless telephone devices, audio-visual devices, toys, cruise/merchant ships and automatic data processing machines.

2.10 Rail freight in Turkey

Iskan and Klaus (2013), explain how the railways in Turkey have been receiving increased interest and revitalization since 2003, when very important steps have started to take place in order to improve and modernize the railway network. They note that the Turkish State Railways" TCDD" which stands for Türkiye Cumhuriyeti Devlet Demiryolları, has planned to invest almost 23.5 billion USD until the year of 2023. TCDD is a national railway company that is responsible for the railway infrastructure in Turkey, as in the development, maintenance and management of railway networks, as mentioned by Uysal (2021). According to Daily Sabah (2020), Turkey is aiming to expand the railway network to reach 16,675 kilometers by 2023, and invest in high-speed trains and conventional lines, as this was announced by the Minister of Transport and Infrastructure at the time, Adil Karaismailoğlu.

2.11 Government trade policy in Turkey

As a vital international trade country, Turkey has a set of well-structured laws and policies regarding trade and its international regulations.

2.11.1 General government trade policy in Turkey

In reference to the Republic of Turkey, Turkey has been a member of the World Trade Organization (WTO) since 1995 and is a party in the General Agreement on Tariffs and Trade 1947 (GATT). Also, according to the European Commission

(2020), the EU and Turkey have been linked together since 31 December 1995 through a Customs Union Agreement. Generally, Turkey was the 5th largest trading partner, export market and provider of imports, for the EU in the year 2019. Akhtar (2021) mentions how Turkey was the world's 19th biggest economy in 2019, with a GDP of $754 billion. The author mentions how Turkey's economy bounced back after the financial crisis it faced during the early 2000's, because of the government decisions taken, as the government made market-oriented changes, invested in infrastructure, and strengthened the rule of law in commercial markets.

Moreover, the country of course continues to face challenges, for example, concerns about corruption, big debt in foreign currencies, and high inflation. The country also continues to face challenges in 2020, because of the Coronavirus 2019 (COVID-19) pandemic, although the challenges and the slower growth were not as significant as in other countries. Akhtar (2021) elaborates about some of the government policies that have been decided upon by the Turkish government. For example, the country has lowered its trade barriers, since the year 1995, after it became a part of the World Trade Organization (WTO), and after it has decided on a Customs Union with the European Union (EU), which encourages the free movement of goods between the EU and Turkey, (except for coal, steel and agriculture). The Turkish Government also signed a trade deal between Turkey and the UK, on December 29, 2020, (after the UK departed from the EU), where the deal mentioned that both countries will continue to trade without tariffs.

2.11.2 Government policy in Turkey regarding BTK railroad

The Eurasian Research Institute discusses some of the government policies taken with regard to the Baku-Tbilisi-Kars's railroad. For example, in 2017, an agreement

was held to construct a logistics center for the BTK project. Also, government parties attended a meeting during which they discussed making the customs procedures at borders more efficient and effective, in order to facilitate trade, as well as manage illegal trade. The meeting resulted in agreeing to conduct a permanent commission that will enhance the relationships between the customs authorities in the regions involved, in order to speed up the customs procedures taking place and reduce the time spent while crossing borders. Furthermore, The Eurasian Research Institute mentions how Turkey and Azerbaijan have signed an agreement to create an electronic system in order to ease the transformation and exchange of information regarding transit ground transport. The Eurasian Research Institute concluded that government in Baku, Tbilisi and Ankara do pay attention regarding the BTK project and undergo "large-scale work" in order to enhance the freight traffic thus making new mechanisms that enhance the exchange of transit cargo information.

According to OECD (2012), when complicated and not needed custom procedures are taken by governments, this would make it harder for the host countries to take the full advantage and efficiency from the global supply chain and eventually this might discourage both the foreign and the domestic investment. OECD (2012) mentions that there is important evidence in the literature that explicitly shows how a country's trade growth, and its' overall competitiveness level are linked to the effectiveness and efficiency of the customer procedures it undertakes. OECD (2012) explains how there are many factors that governments should consider when implementing international trade strategies; for example, "all customs and border procedures should be designed and implemented to provide consistency, predictability, simplicity and transparency so as to avoid unnecessary burdens on the flow of goods, services and businesspeople". OECD (2012) also

mentions that governments participation in international trade agreements can also help attract investment, as those agreement would help create larger markets, would allow to greater scale economies, and even signal changes that might take place in future policies. The study suggest that governments need to undergo trade and investment agreements and keep evaluating them in ways to maximize their benefits.

CHAPTER 3

HYPOTHESIS DEVELOPMENT

Looking at the literature, we can observe the vitality of the Silk Road routes on international trade and the huge ramifications it might attain. We can also observe the extraordinary investments being allocated by governments in the Silk Road's railway routes and long-term agreements with promising goals regarding increases in trade indices being agreed upon by governments. Thus, there was a need to examine the relationship between the change in Silk Road railway capacity and trade indices.

In line with the literature discussed above, we present the hypotheses of this research followed by a brief discussion of these hypotheses.

3.1 Hypotheses

This section provides a list of the hypotheses of the study which will be discussed in detail in the next section.

- Hypothesis 1: There is a statistically significant relationship between Turkish freight transport rail capacity (ton-km) and Turkish imports volume ($1000).
    - Hypothesis 1.1: There is a statistically significant relationship between Turkish freight transport rail capacity (ton-km) and Turkish imports volume of vehicles and accessories ($1000).
    - Hypothesis 1.2: There is a statistically significant relationship between Turkish freight transport rail capacity (ton-km) and Turkish imports volume of organic chemicals ($1000).
- Hypothesis 2: There is a statistically significant relationship between Turkish freight transport rail capacity (ton-km) and Turkish exports volume ($1000).

    - Hypothesis 2.1: There is a statistically significant relationship between Turkish freight transport rail capacity (ton-km) and Turkish exports of vehicles and accessories ($1000).
    - Hypothesis 2.2: There is a statistically significant relationship between Turkish freight transport rail capacity (ton-km) and Turkish exports of Natural or cultured pearls, precious or semi-precious stones, or precious metals ($1000).
- Hypothesis 3: There is a statistically significant relationship between Turkish freight transport rail capacity (ton-km) and Turkish trade volume ($1000).
- Hypothesis 4: There is a statistically significant relationship between Turkish freight transport rail capacity (ton-km) and Turkish trade volume with Azerbaijan, a Silk Road partner ($1000).
    - Hypothesis 4.1: There is a statistically significant relationship between Turkish freight transport rail capacity (ton-km) and Turkish exports volume with Azerbaijan, a Silk Road partner ($1000).
    - Hypothesis 4.2: There is a statistically significant relationship between Turkish freight transport rail capacity (ton-km) and Turkish imports volume with Azerbaijan, a Silk Road partner ($1000).
- Hypothesis 5: There is a statistically significant relationship between Turkish freight transport rail capacity (ton-km) and Turkish trade volume with Georgia, a Silk Road partner ($1000).
    - Hypothesis 5.1: There is a statistically significant relationship between Turkish freight transport rail capacity (ton-km) and Turkish exports volume with Georgia, a Silk Road partner ($1000).

    - Hypothesis 5.2: There is a statistically significant relationship between Turkish freight transport rail capacity (ton-km) and Turkish imports volume with Georgia, a Silk Road partner ($1000).
- Hypothesis 6 There is a statistically significant relationship between Turkish freight transport rail capacity (ton-km) and Turkish trade volume with China, a Silk Road partner ($1000).
    - Hypothesis 6.1: There is a statistically significant relationship between Turkish freight transport rail capacity (ton-km) and Turkish exports volume with China, a Silk Road partner ($1000).
    - Hypothesis 6.2: There is a statistically significant relationship between Turkish freight transport rail capacity (ton-km) and Turkish imports volume with China, a Silk Road partner ($1000).
- Hypothesis 7: There is a statistically significant relationship between Turkish freight transport rail capacity (ton-km) and Turkish trade volume with the three Silk Road partners: China, Georgia, and Azerbaijan ($1000).
    - Hypothesis 7.1: There is a statistically significant relationship between Turkish freight transport rail capacity (ton-km) and Turkish exports volume with the three Silk Road partners: China, Georgia, and Azerbaijan ($1000).
    - Hypothesis 7.2: There is a statistically significant relationship between Turkish freight transport rail capacity (ton-km) and Turkish imports volume with the three Silk Road partners: China, Georgia, and Azerbaijan ($1000).

3.2 Hypothesis description

Hypothesis 1 was conducted to study the effect of the new Silk Road railway routes on the Turkish imports. Hypotheses 1.1 and 1.2 were conducted to undergo a more thorough analysis and see the effect of Turkish Silk Road railway routes on specific product categories, as it was mentioned in the literature how some product categories may be more likely to be affected by the new railway routes. In order to determine the specific product categories, a series of correlation analyses was performed on commodities listed under the United Nations Commodity Trade Statistics Database (2021). Commodity code 87: Vehicles other than railway, tramway – with description of "Vehicles other than railway or tramway rolling-stock, and parts and accessories thereof" had high correlation with exports and low correlation with imports, and was chosen due to this reason. For imports, commodity code 29: Organic chemicals had high correlation figures therefore was added to the analysis as a product category. Commodity code 87 had low correlation for imports whereas commodity code 29 had high correlation.

Hypothesis 2 was conducted to study the effect of the new Silk Road railways routes on the Turkish exports and observe whether the effect of the railways routes on the Turkish exports was different from that on the Turkish imports as observed from Hypothesis 1. Hypotheses 2.1 and 2.2 were conducted to undergo a more thorough analysis and see the effect of the Turkish Silk Road railway routes on specific product categories. Apart from the Commodity code 87 as discussed above, the other product category chosen for exports was commodity code 71: Pearls, precious stones, metals, coins, etc. – with description of "Natural or cultured pearls, precious or semi-precious stones, precious metals, metals clad with precious metal

and articles thereof; imitation jewelry; coin". Commodity code 87 had high correlation for exports whereas commodity code 71 had low correlation.

Hypothesis 3 was conducted in order to study the effect of the Silk Road railway routes on the overall trade in Turkey aggregately.

Hypotheses 4, 5 and 6 were conducted to study the effect of the Silk Road railway routes on trade between Turkey and its Silk Road partners Azerbaijan, Georgia and China. The sub-hypotheses for each country look at the effect on imports and exports separately while the primary hypotheses look at overall trade.

Finally Hypothesis 7 and its sub-hypotheses examine the effect of the Silk Road railway routes on trade between Turkey and its Silk Road partners China, Georgia and Azerbaijan collectively; where overall trade appears in the primary hypothesis and imports and exports appear in the sub hypotheses.

CHAPTER 4

METHODOLOGY

For this study, data has been collected from two main sources. All data regarding Turkish trade indices has been collected from TÜİK standing for "Turkish Statistical Institute" which was founded in 1926. TÜİK is the Turkish government agency responsible for producing official statistics on Turkey, its economy, society, culture and resources. For trade indices regarding the other countries (China- Georgia- Azerbaijan) and regarding the trade of specific products, "Trade Map" was used, which provides monthly, quarterly and yearly trade data and statistics for international business development. Trade Map was developed by the International Trade Centre UNCTAD/WTO (ITC) and provides different statistical indices like import and export values, volumes, growth rates, market shares, etc. covering 220 countries and territories. The data can be approached from a product, country or bilateral trade perspective.

4.1 Data analysis

After the data was collected from TÜİK and Trade Map, it was organized on Excel sheets and filtered out according to the data chosen to be used in this research. The data was then processed using Excel and SPSS to apply regression analysis.

In this study, regression analysis was undergone in order to observe how the new Silk Road railway routes are affecting trade indices in the chosen countries. The aim was to observe how the changes in the Silk Road railway routes capacity over the years is triggering changes in the trade indices in the chosen countries, as in, to check if there is a statistically significant effect of the new Silk Road railway routes

capacity on the trade indices of the 4 countries chosen. Also, given that regression analysis is also capable of showing us a cause and effect relationship between the variables, it could provide us with a detailed view of our data.

CHAPTER 5

ANALYSES AND RESULTS

In this chapter, regression analysis results are presented and examined. For all the regression analysis done, the independent variable was the railway capacity of Turkey in ton-km and the dependent variable was the trade volume in 1000 USD. The use of trade volume as the dependent variable is parallel to the work of Li, Bolton, and Westphal (2018) which is one of the principal studies this research is based upon. The authors use the status of rail connection to China as their main independent variable along with several control variables not relevant to our research question.

All regression analyses had exactly 19 observations as all the data collected was between 2001 and 2019 inclusively. To examine the statistical significance of the analysis, Regression ANOVA results were queried to check for the significance value; aka p-value. In this chapter, the results are discussed in 5 sections respectively:

1. Turkish trade: exports, imports, and total trade for specific product categories and for all products as total as well.
2. Turkish trade with Azerbaijan: exports, imports, and total trade
3. Turkish trade with Georgia: exports, imports, and total trade
4. Turkish trade with China: exports, imports, and total trade
5. Turkish trade with Silk Road partners (Azerbaijan. Georgia, and China) aggregately: exports, imports, and total trade

5.1 Turkish trade

In this section, the results for the first group of hypothesis are discussed. Turkish trade (imports, exports, and total) is examined as dependent variable against the railway capacity as independent variable. Also, for imports and exports, a separate regression was made for two products categories each. In the table below, the R-squared value of each regression is listed along with the significance value (p-value) and the coefficient. The coefficient refers to the slope of the fit curve indicating the increase in trade volume for every extra ton-km added to the railway capacity (given that all regression coefficients were positive). Table 1 summarizes the results.

Table 1. The Results of Hypothesis H1 to H3

Hypothesis	Description	Regression R-Squared	P-Value / Significance F	Coefficient
H1	Turkey's Total Exports Volume	0.851948441	0.000000018186	21495.8699
H1.1	Turkey's Total Exports Volume of Vehicles Category	0.899391403	0.000000000666	3348.96095
H1.2	Turkey's Total Exports Volume of Natural Pearls and Stones Category	0.382596324	0.004755588	1406.604
H2	Turkey's Total Imports Volume	0.683813207	0.000012657180	28195.1766
H2.1	Turkey's Total Imports Volume of Vehicles Category	0.431870551	0.00223386	1604.51024
H2.2	Turkey's Total Imports Volume of Organic Chemicals	0.847396642	0.000000023580	621.095715
H3	Turkey's Total Trade Volume	0.766231863	0.000000924884	49691.0465

For H1, the regression is made between volume of all Turkish exports and the railway capacity. As shown in Table 1 above, the R-squared value of 0.85 shows the strength of the relationship between the variables. The value is statistically significant according to the ANOVA significance value (P-value) of 0.00. Thus, it is concluded that the capacity of the Turkish railway has a statistically significant effect on the Turkish general export index by a coefficient of 2,1495,000$ for every 1 ton-km as Figure 9 and Table 2 below shows.

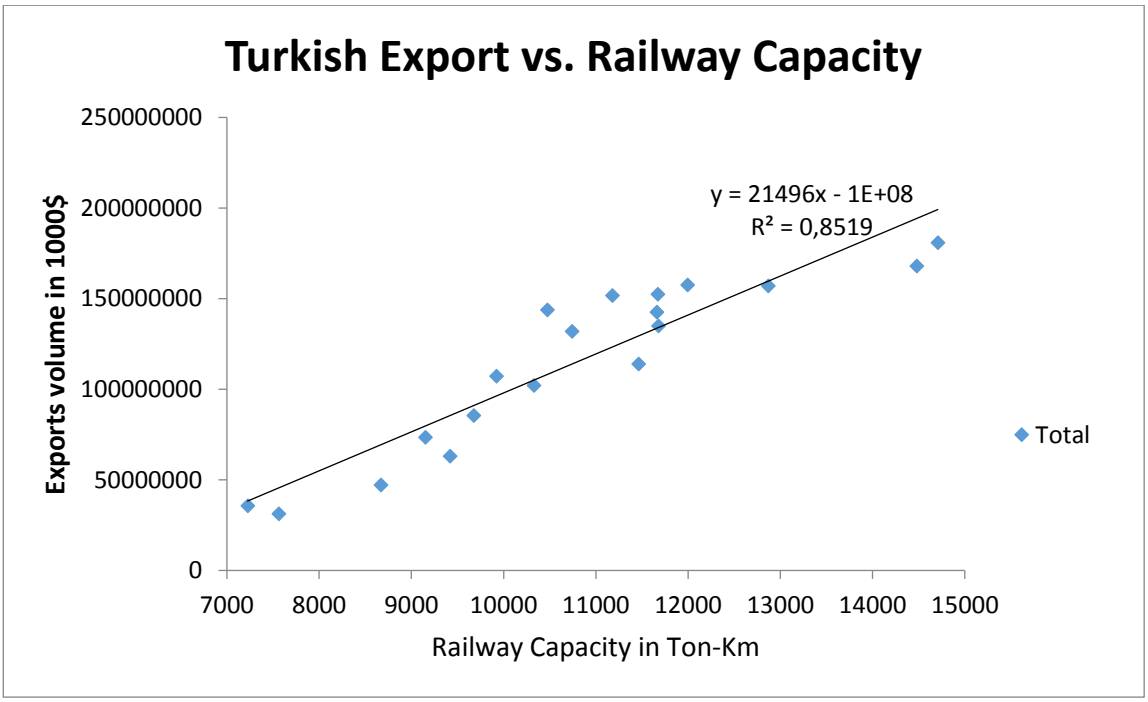

Fig. 9 Total Turkish exports vs. railway capacity

Table 2. Regression Analysis Output for H1

Multiple R	0.92		
R Square	0.85		
Adjusted R Square	0.84		
Standard Error	18461312		
Observations	19.00		
	Regression	Residual	Total
df	1.00	17.00	18.00
SS	33340673060043400	5793940535802220	39134613595845600
MS	33340673060043400	340820031517778	
F	97.82		
Significance F	0.0000000182		
	Intercept	RAIL	
Coefficients	-116981422	21496	
Standard Error	23812095	2173	
t Stat	-4.91	9.89	
P-value	0.0001315937	0.0000000182	
Lower 95%	-167220550	16910	
Upper 95%	-66742293	26081	

For H1.1, the regression is made between volume of Turkish exports of vehicles and accessories and the railway capacity. As shown in Table 1 above, the R-squared value of 0.9 shows the strength of the relationship between the variables. The value is statistically significant according to the ANOVA significance value (p-value) of 0.00. Thus, it is concluded that the capacity of the Turkish railway has a statistically significant effect on the Turkish export of vehicles and accessories index by a coefficient of 3,348,000$ for every 1 ton-km, as Figure 10 and Table 3 below shows.

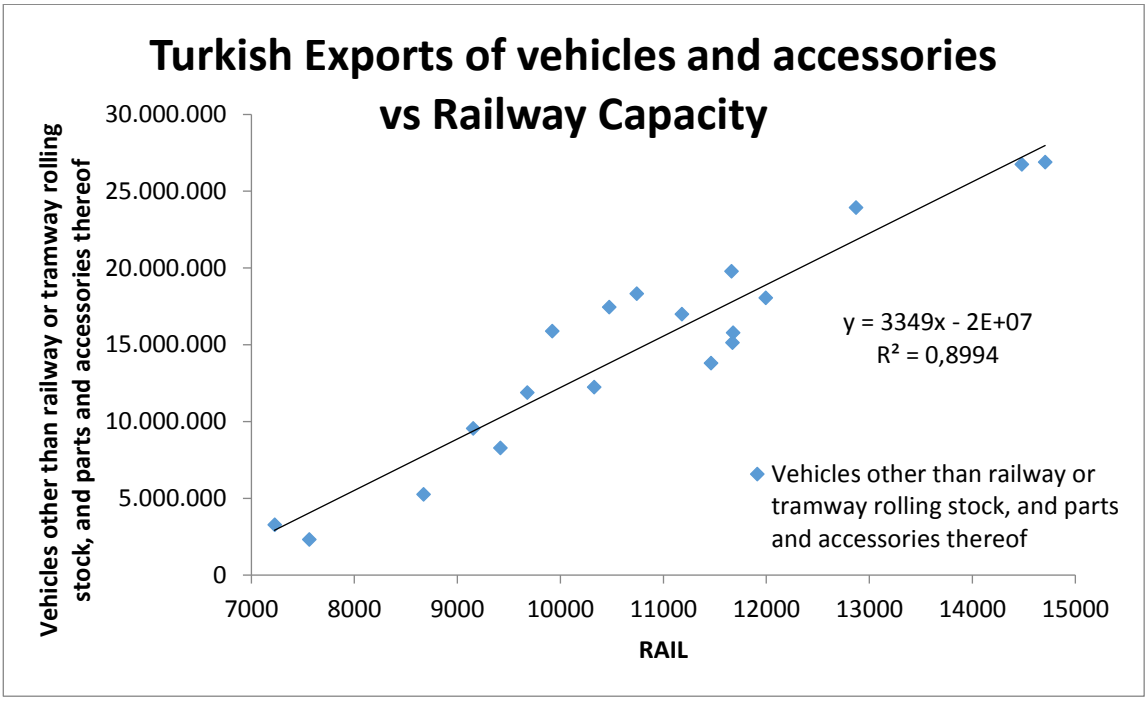

Fig. 10 Turkish exports of vehicles and accessories vs. railway capacity

Table 3. Regression Analysis Output for H1.1

Multiple R	0.948362485		
R Square	0.899391403		
Adjusted R Square	0.89347325		
Standard Error	2307602.281		
Observations	19.00		
	ANOVA		
	Regression	Residual	Total
df	1.00	17.00	18.00
SS	809253302220036	90525480877141	899778783097177
MS	809253302220036	5325028286891	
F	151.97		
Significance F	0.0000000007		
	Intercept	RAIL	
Coefficients	-21274982	3349	
Standard Error	2976432	272	
t Stat	-7.15	12.33	
P-value	0.0000016327	0.0000000007	
Lower 95%	-27554706	2776	
Upper 95%	-14995259	3922	

For H1.2, the regression is made between volume of Turkish exports of natural or colored pearls, precious or semi-precious stones or precious metals, and the railway capacity. The p-value of 0.004765, shown in Table 1 above, shows a statistically significant relationship between the variables. However, the relatively weak R-squared value of 0.39 indicates that the railway capacity of Turkey can't explain much in the variation of the dependent variable, the trade volume, for this specific product category. From the table, we can also observe that the capacity of the Turkish railway has an effect on the Turkish general export index by a coefficient of 1,406,000$ for every 1 ton-km, as Figure 11 and Table 4 below shows.

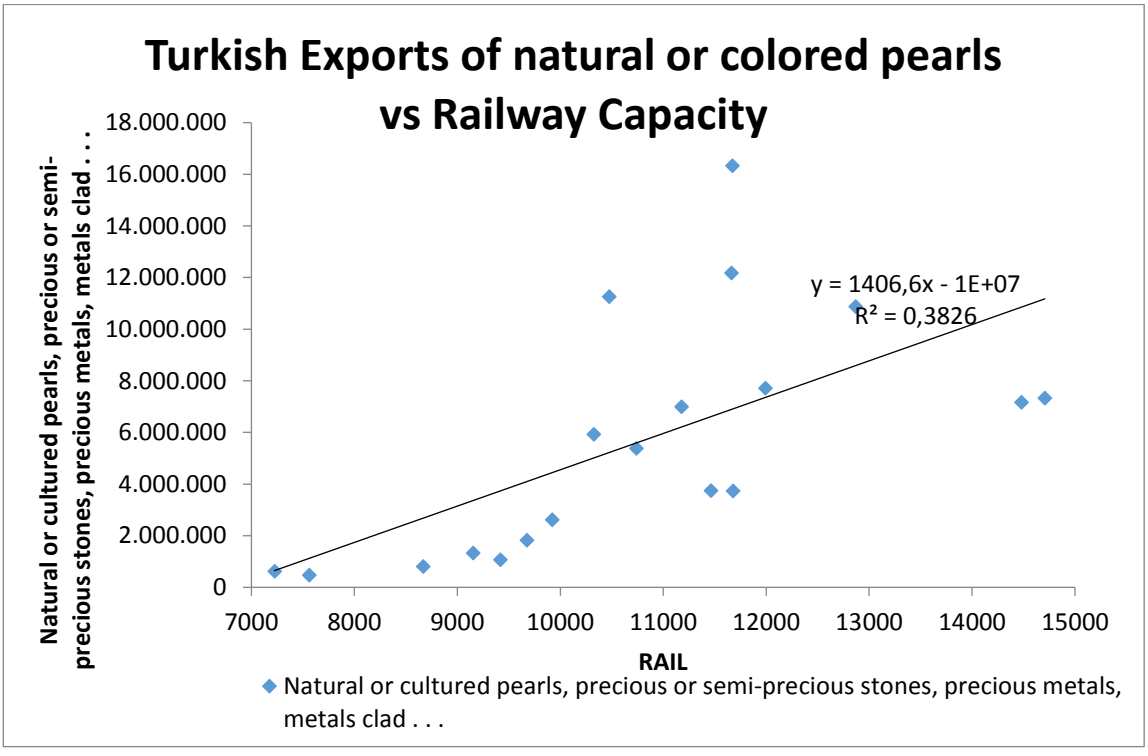

Fig. 11 Turkish exports of natural or cultured pearls, precious or semi-precious stones, precious metals vs. railway capacity

Table 4. Regression Analysis Output for H1.2

Multiple R	0.62		
R Square	0.38		
Adjusted R Square	0.35		
Standard Error	3681236.77		
Observations	19.00		
	Regression	Residual	Total
df	1.00	17.00	18.00
SS	142760482380297	230375570909299	373136053289596
MS	142760482380297	13551504171135	
F	10.53		
Significance F	0.0047555877		
	Intercept	RAIL	
Coefficients	-9512759	1407	
Standard Error	4748198	433	
t Stat	-2.00	3.25	
P-value	0.0613352578	0.0047555877	
Lower 95%	-19530580	492	
Upper 95%	505063	2321	

For H2, the regression is made between volume of Turkish imports volume and the railway capacity. As shown in Table 1 above, the R-squared value of 0.68 shows the strength of the relationship between the variables. The value is statistically significant according to the ANOVA significance value (p-value) of 0.00. Thus, it is concluded that the capacity of the Turkish railway has a statistically significant effect on the Turkish import index by a coefficient of 28,195,000$ for every 1 ton-km, as Figure 12 and Table 5 below shows.

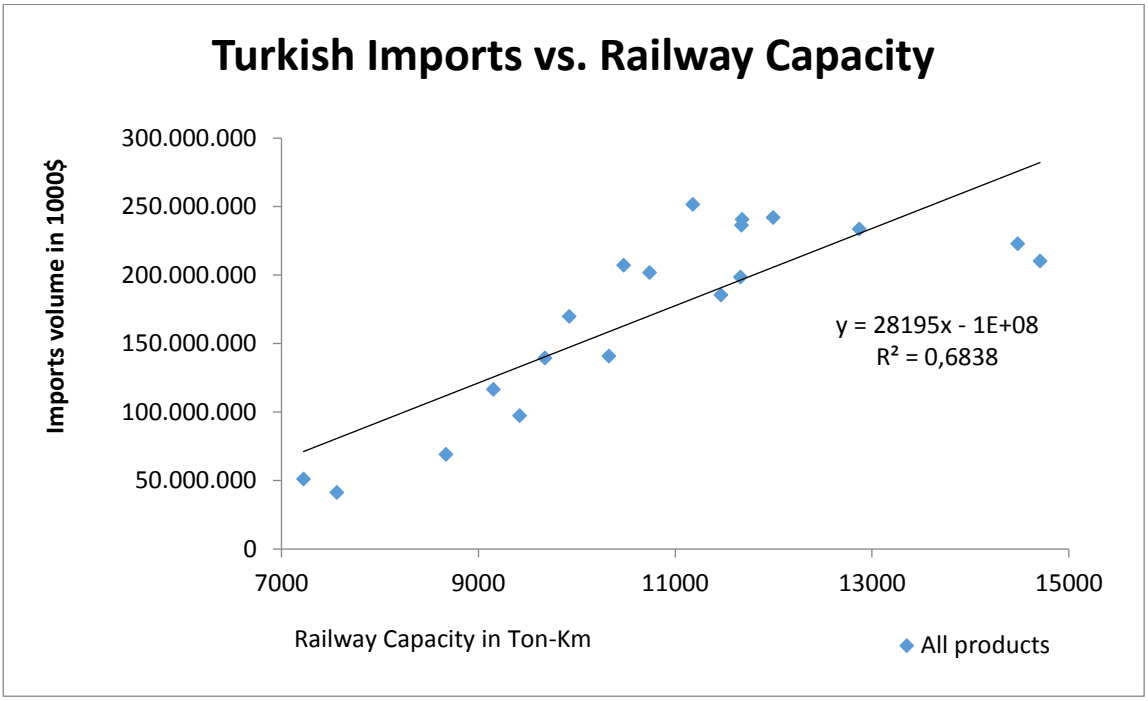

Fig. 12 Total Turkish imports vs. railway capacity

Table 5. Regression Analysis Output for H2

Multiple R	0.83		
R Square	0.68		
Adjusted R Square	0.67		
Standard Error	39498957.71		
Observations	19.00		
	Regression	Residual	Total
df	1.00	17.00	18.00
SS	57360635045999100	26522850222866500	83883485268865600
MS	57360635045999100	1560167660168620	
F	36.77		
Significance F	0.0000126572		
	Intercept	RAIL	
Coefficients	-132483371	28195	
Standard Error	50947242	4650	
t Stat	-2.60	6.06	
P-value	0.0186644891	0.0000126572	
Lower 95%	-239972657	18385	
Upper 95%	-24994085	38006	

For H2.1, the regression is made between volume of Turkish imports volume of vehicles and accessories and the railway capacity. The p-value of 0.0022, shown in Table 1 above, shows a statistically significant relationship between the variables. However, the relatively weak R-squared value of 0.43 indicates that the railway capacity of Turkey can't explain much in the variation of the dependent variable, the imports volume of vehicles and accessories, for this specific product category. From the table, we can also observe that the capacity of the Turkish railway has an effect on the Turkish general export index by a coefficient of 1,604,000$ for every 1 ton-km, as Figure 13 and Table 6 below shows.

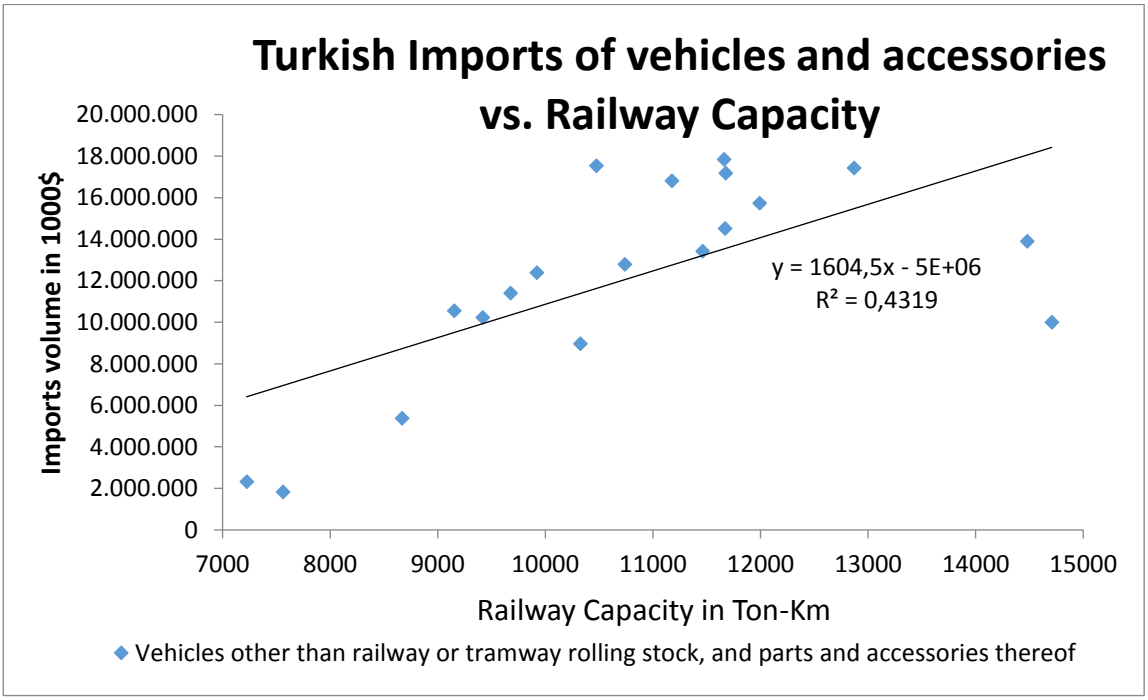

Fig. 13 Turkish imports of vehicles and accessories vs. railway capacity

Table 6. Regression Analysis Output for H2.1

Multiple R	0.66		
R Square	0.43		
Adjusted R Square	0.40		
Standard Error	3791377.64		
Observations	19.00		
	Regression	Residual	Total
df	1.00	17.00	18.00
SS	185758758532199	244367254761142	430126013293340
MS	185758758532199	14374544397714	
F	12.92		
Significance F	0.0022338599		
	Intercept	RAIL	
Coefficients	-5179367	1605	
Standard Error	4890262	446	
t Stat	-1.06	3.59	
P-value	0.3043631385	0.0022338599	
Lower 95%	-15496917	663	
Upper 95%	5138183	2546	

For H2.2, the regression is made between volume of Turkish imports volume of organic chemicals and the railway capacity. As shown in Table 1 above, the R-squared value of 0.85 shows the strength of the relationship between the variables. The value is statistically significant according to the ANOVA significance value (p-value) of 0.00. Thus, it is concluded that the capacity of the Turkish railway has a statistically significant effect on the Turkish import of organic chemicals index by a coefficient of 621,000$ for every 1 ton-km, as Figure 14 and Table 7 below shows.

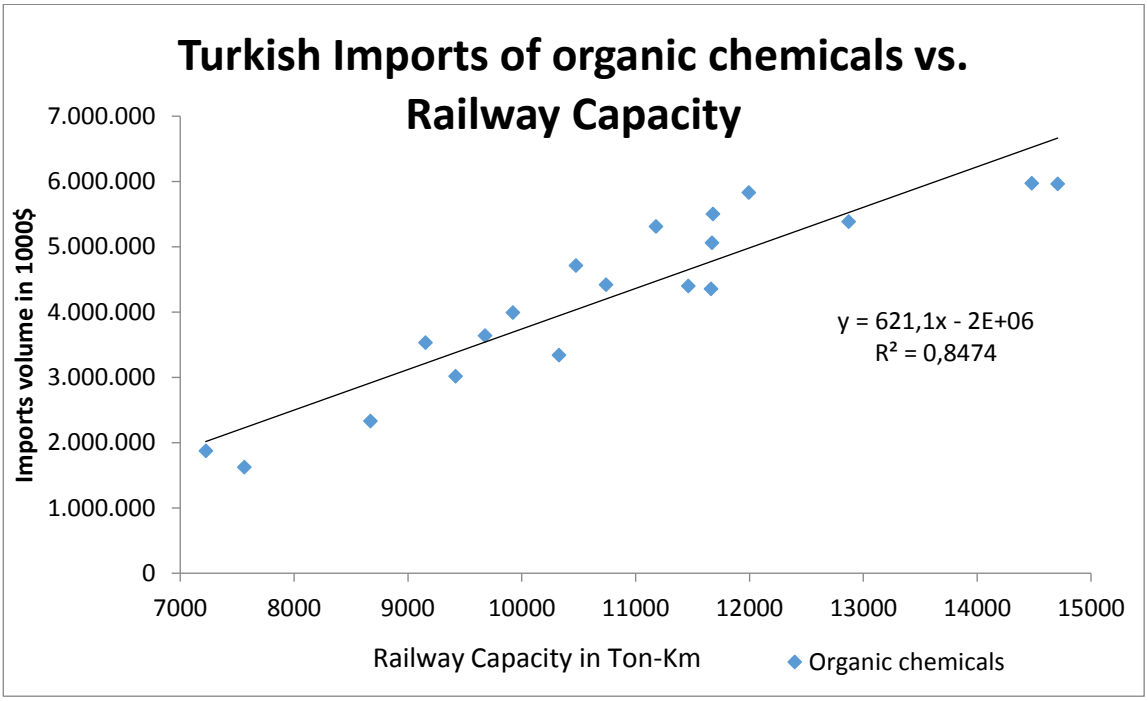

Fig. 14 Turkish imports of organic chemicals vs. railway capacity

Table 7 Regression Analysis Output for H2.2

Multiple R	0.92		
R Square	0.85		
Adjusted R Square	0.84		
Standard Error	543006.35		
Observations	19.00		
	Regression	Residual	Total
df	1.00	17.00	18.00
SS	27834368951683	5012550159776	32846919111459
MS	27834368951683	294855891752	
F	94.40		
Significance F	0.0000000236		
	Intercept	RAIL	
Coefficients	-2470039	621	
Standard Error	700390	64	
t Stat	-3.53	9.72	
P-value	0.0025898965	0.0000000236	
Lower 95%	-3947733	486	
Upper 95%	-992345	756	

For H3, the regression is made between volume of Turkish total trade volume and the railway capacity. As shown in Table 1 above, the R-squared value of 0.7662 shows the strength of the relationship between the variables. The value is statistically significant according to the ANOVA significance value (p-value) of 0.00. Thus, it is concluded that the capacity of the Turkish railway has a statistically significant effect on the Turkish total trade volume index by a coefficient of 49,691,000$ for every 1 ton-km, as Figure 15 and Table 8 below shows.

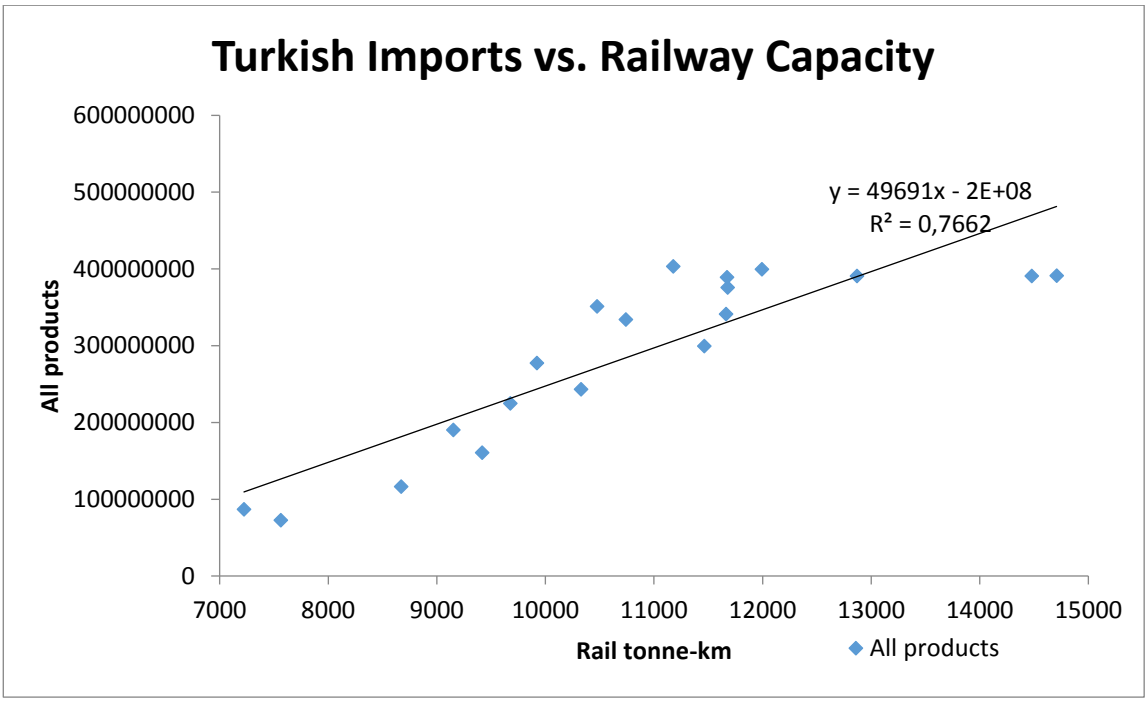

Fig. 15 Total Turkish trade volume vs. railway capacity

Table 8. Regression Analysis Output for H3

Multiple R	0.83		
R Square	0.68		
Adjusted R Square	0.67		
Standard Error	39498957.71		
Observations	19.00		
	Regression	Residual	Total
df	1.00	17.00	18.00
SS	57360635045999100	26522850222866500	83883485268865600
MS	57360635045999100	1560167660168620	
F	36.77		
Significance F	0.0000126572		
	Intercept	RAIL	
Coefficients	-132483371	28195	
Standard Error	50947242	4650	
t Stat	-2.60	6.06	
P-value	0.0186644891	0.0000126572	
Lower 95%	-239972657	18385	
Upper 95%	-24994085	38006	

5.2 Turkish trade with Azerbaijan

For H4.1, the regression is made between volume of Turkish exports volume with Azerbaijan and the railway capacity. The P-value of 0.00464, shown in Table 9 below, shows a statistically significant relationship between the variables. However, the relatively weak R-squared value of 0.38 indicates that the railway capacity of Turkey can't explain much in the variation of the dependent variable, the Turkish exports volume with Azerbaijan. From the table, we can also observe that the capacity of the Turkish railway has an effect on the Turkish exports volume with Azerbaijan index by a coefficient of 264,000$ for every 1 ton-km, as Figure 16 and Table 10 below shows.

Table 9. The Results of Hypothesis H4

Hypothesis	Description	Regression R-Squared	P-Value / Significance F	Coefficient
H4.1	Turkey's Exports Volume (Azerbaijan)	0.384223272	0.004642276	264.815473
H4.2	Turkey's Imports Volume (Azerbaijan)	0.605927139	0.000087	40.5279255
H4	Turkey's Total Trade Volume (Azerbaijan)	0.44190639	0.001902026	305.343398

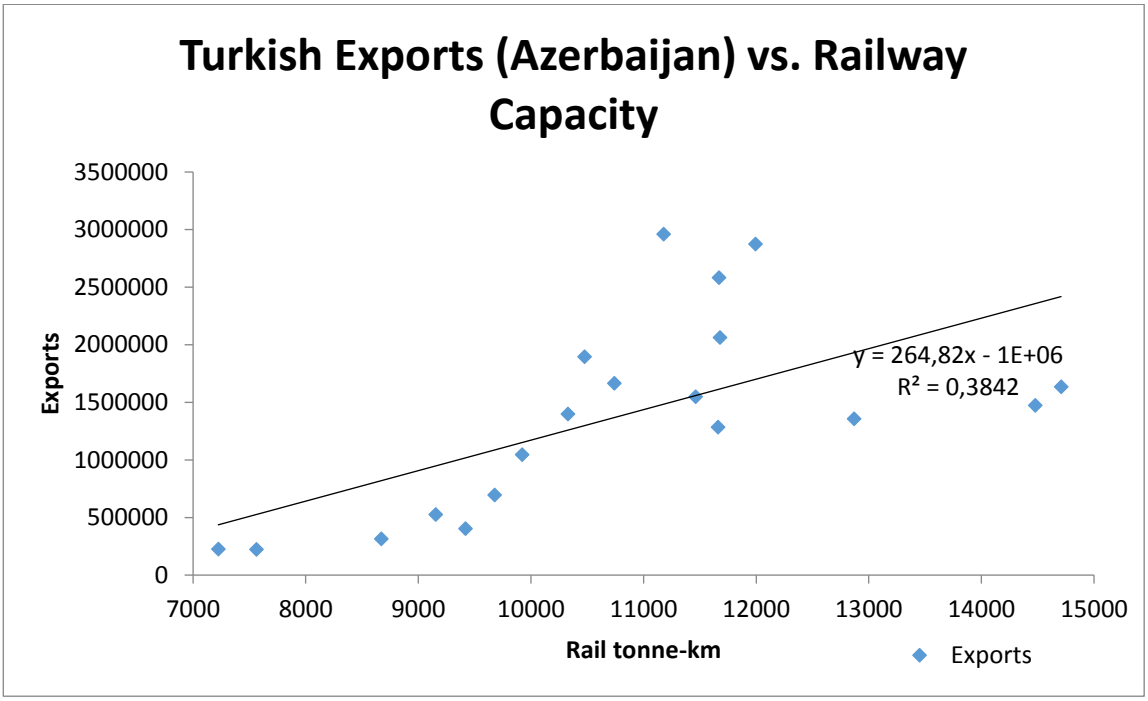

Fig. 16 Total Turkish exports with Azerbaijan vs. railway capacity

Table 10. Regression Analysis Output for H4.1

Multiple R	0.62		
R Square	0.38		
Adjusted R Square	0.35		
Standard Error	690670.42		
Observations	19.00		
	Regression	Residual	Total
df	1.00	17.00	18.00
SS	5060005938425	8109435666497	13169441604922
MS	5060005938425	477025627441	
F	10.61		
Significance F	0.0046422757		
	Intercept	RAIL	
Coefficients	-1476408	265	
Standard Error	890853	81	
t Stat	-1.66	3.26	
P-value	0.1157970000	0.0046422757	
Lower 95%	-3355943	93	
Upper 95%	403126	436	

For H4.2, the regression is made between volume of Turkish imports volume with Azerbaijan and the railway capacity. As shown in Table 9 above, the R-squared

value of 0.60 shows the strength of the relationship between the variables. The value is statistically significant according to the ANOVA significance value (p-value) of 0.00. Thus, it is concluded that the capacity of the Turkish railway has a statistically significant effect on the Turkish imports volume with Azerbaijan index by a coefficient of 40,000$ for every 1 ton-km, as Figure 17 and Table 11 below shows.

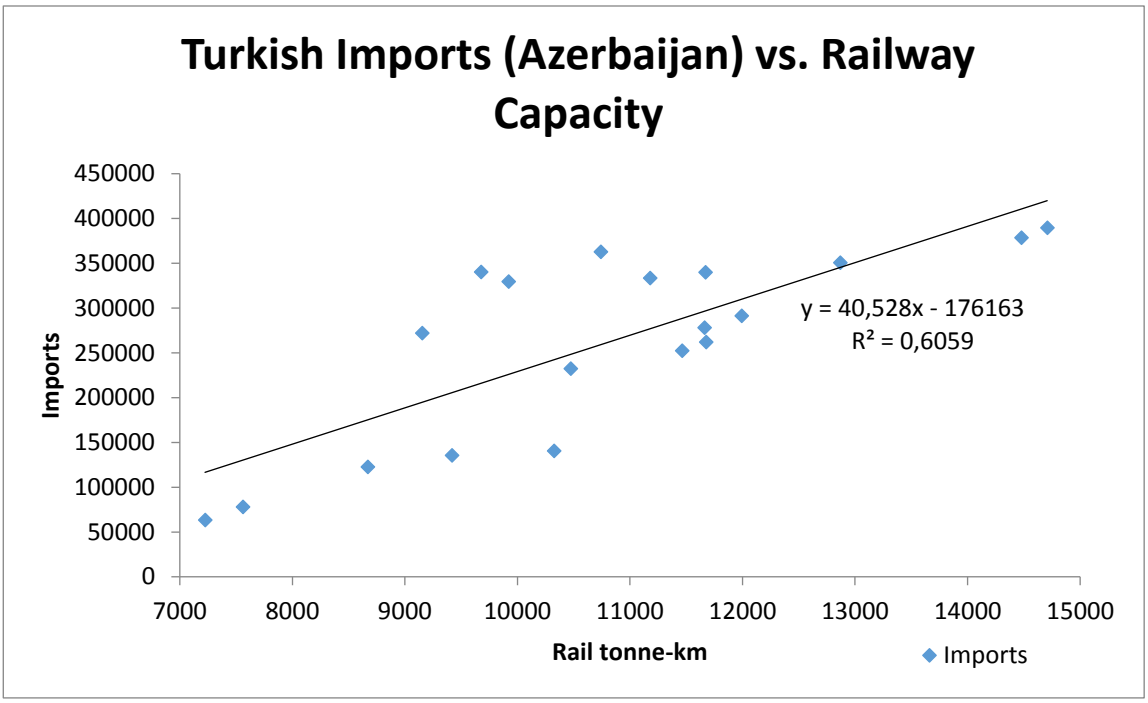

Fig. 17 Total Turkish imports with Azerbaijan vs. railway capacity

Table 11. Regression Analysis Output for H4.2

Multiple R	0.78		
R Square	0.61		
Adjusted R Square	0.58		
Standard Error	67334.89		
Observations	19.00		
	Regression	Residual	Total
df	1.00	17.00	18.00
SS	118514929140	77077777353	195592706492
MS	118514929140	4533986903	
F	26.14		
Significance F	0.0000866270		
	Intercept	RAIL	
Coefficients	-176163	41	
Standard Error	86851	8	
t Stat	-2.03	5.11	
P-value	0.0584926557	0.0000866270	
Lower 95%	-359402	24	
Upper 95%	7077	57	

For H4, the regression is made between volume of Turkish total trade volume with Azerbaijan and the railway capacity. The p-value of 0.001902, shown in Table 9 above, shows a statistically significant relationship between the variables. However, the relatively weak R-squared value of 0.44 indicates that the railway capacity of Turkey can't explain much in the variation of the dependent variable, the Turkish total trade volume with Azerbaijan. From the table, we can also observe that the capacity of the Turkish railway has an effect on the Turkish total trade volume with Azerbaijan index by a coefficient of 305,000$ for every 1 ton-km, as Figure 18 and Table 12 below shows.

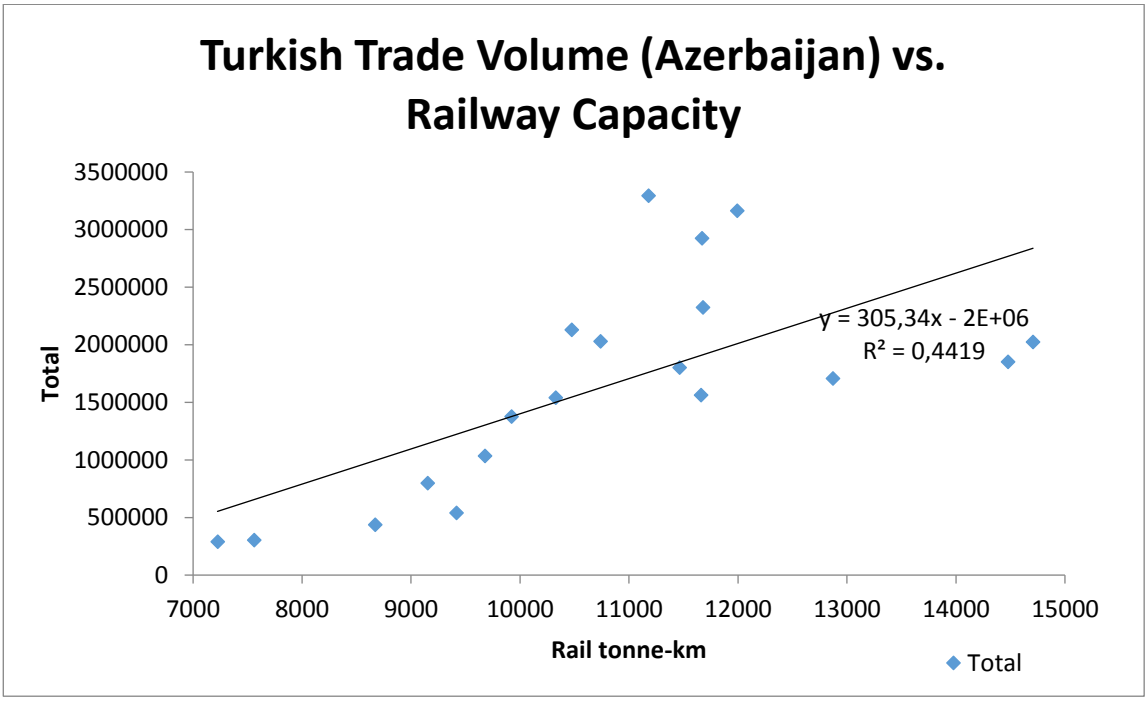

Fig. 18 Total Turkish trade volume with Azerbaijan vs. railway capacity

Table 12. Regression Analysis Output for H4

Multiple R	0.66		
R Square	0.44		
Adjusted R Square	0.41		
Standard Error	706943.35		
Observations	19.00		
	Regression	Residual	Total
df	1.00	17.00	18.00
SS	6727309097428	8496071363158	15223380460586
MS	6727309097428	499768903715	
F	13.46		
Significance F	0.0019020259		
	Intercept	RAIL	
Coefficients	-1652571	305	
Standard Error	911842	83	
t Stat	-1.81	3.67	
P-value	0.0876329936	0.0019020259	
Lower 95%	-3576390	130	
Upper 95%	271248	481	

5.3 Turkish trade with Georgia

For H5.1, the regression is made between volume of Turkish exports with Georgia and the railway capacity. As shown in Table 13, the R-squared value of 0.78 shows the strength of the relationship between the variables. The value is statistically significant according to the ANOVA significance value (p-value) of 0.00. Thus, it is concluded that the capacity of the Turkish railway has a statistically significant effect on the Turkish exports volume with Georgia index by a coefficient of 211,000$ for every 1 ton-km, as Figure 19 and Table 14 below shows.

Table 13. The Results of Hypothesis H5

Hypothesis	Description	Regression R-Squared	P-Value / Significance F	Coefficient
H5.1	Turkey's Exports Volume (Georgia)	0.778174168	0.00000059	211.160687
H5.2	Turkey's Imports Volume (Georgia)	0.001109786	0.892304608	1.45940472
H5	Turkey's Total Trade Volume (Georgia)	0.772989939	0.0000007	212.620092

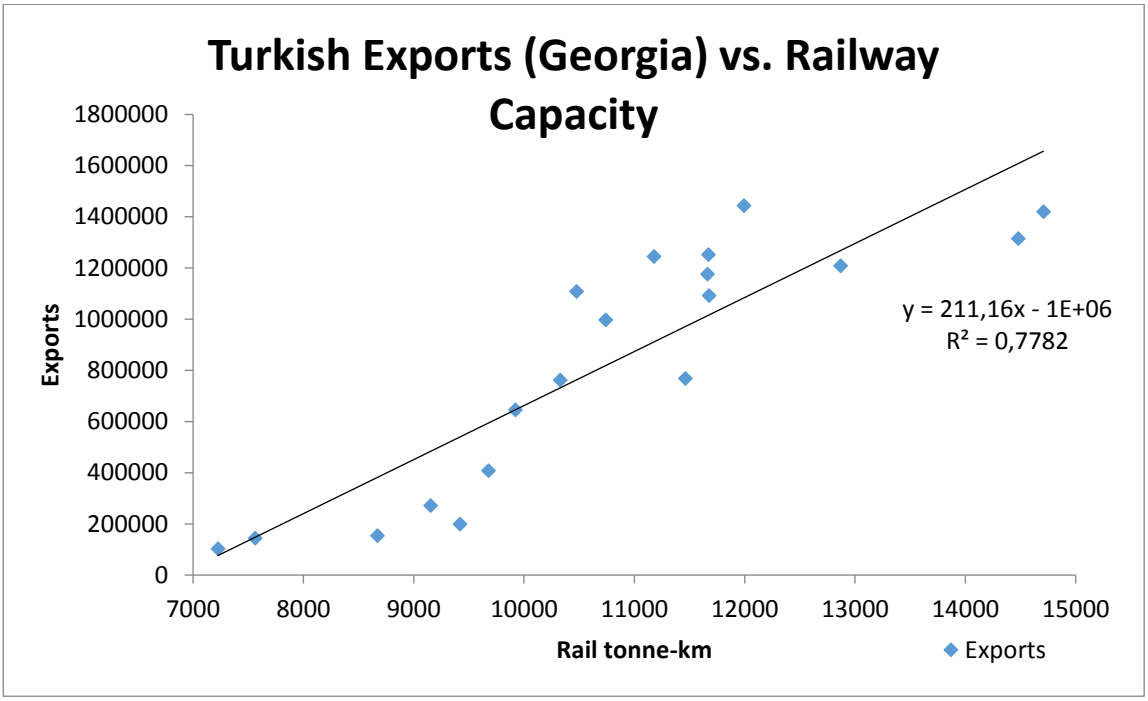

Fig. 19 Total Turkish exports with Georgia vs. railway capacity

Table 14. Regression Analysis Output for H5.1

Multiple R	0.88		
R Square	0.78		
Adjusted R Square	0.77		
Standard Error	232267.48		
Observations	19.00		
	Regression	Residual	Total
df	1.00	17.00	18.00
SS	3217291746968	917119135120	4134410882088
MS	3217291746968	53948184419	
F	59.64		
Significance F	0.0000005883		
	Intercept	RAIL	
Coefficients	-1449108	211	
Standard Error	299587	27	
t Stat	-4.84	7.72	
P-value	0.0001543206	0.0000005883	
Lower 95%	-2081182	153	
Upper 95%	-817034	269	

For H5.2, the regression is made between volume of Turkish import volume with Georgia and the railway capacity. As shown in Table 13, there is no significant relationship between the variables. The p-value of 0.89 (higher than 0.05) is not statistically significant. The findings are also shown in Figure 20 and Table 15 below.

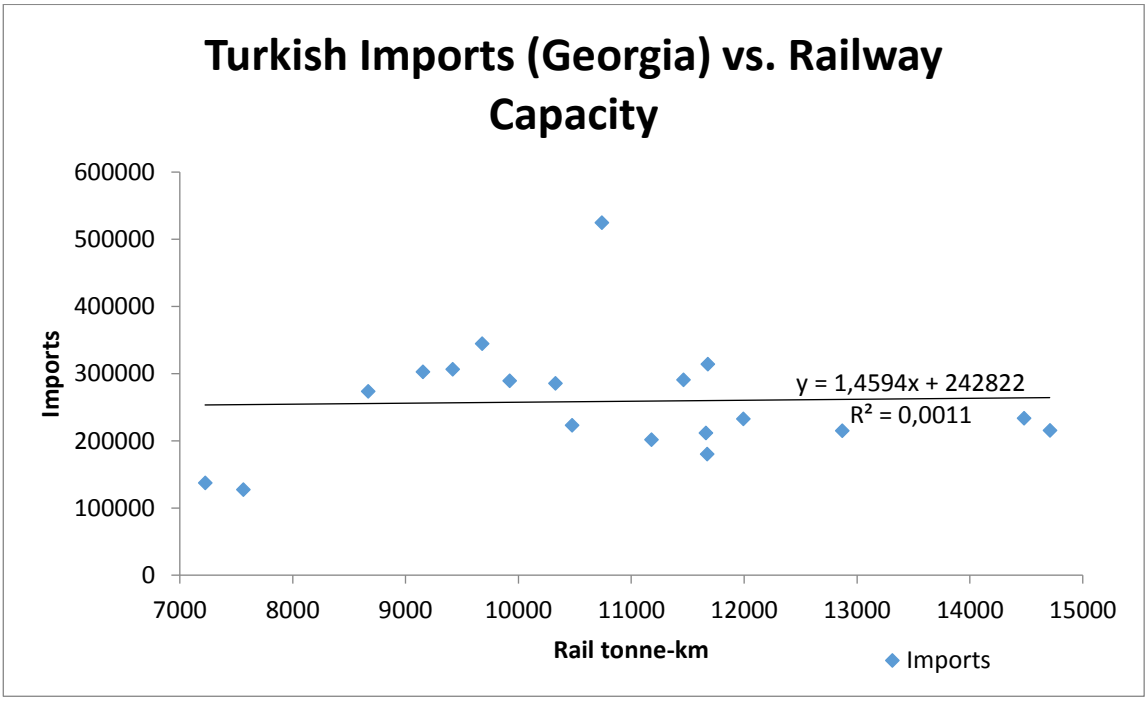

Fig. 20 Total Turkish imports with Georgia vs. railway capacity

Table 15. Regression Analysis Output for H5.2

Multiple R	0.03		
R Square	0.00		
Adjusted R Square	-0.06		
Standard Error	90203.36		
Observations	19.00		
	Regression	Residual	Total
df	1.00	17.00	18.00
SS	153679454	138322980496	138476659950
MS	153679454	8136645912	
F	0.02		
Significance F	0.8923046076		
	Intercept	RAIL	
Coefficients	242822	1	
Standard Error	116348	11	
t Stat	2.09	0.14	
P-value	0.0522531182	0.8923046076	
Lower 95%	-2650	-21	
Upper 95%	488294	24	

For H5, the regression is made between volume of Turkish trade with Georgia and the railway capacity. As shown in Table 13 above, the R-squared value of 0.77 shows the strength of the relationship between the variables. The value is statistically significant according to the ANOVA significance value (p-value) of 0.00. Thus, it is concluded that the capacity of the Turkish railway has a statistically significant effect on the Turkish total trade volume with Georgia index by a coefficient of 212,000$ for every 1 ton-km, as Figure 21 and Table 16 below shows.

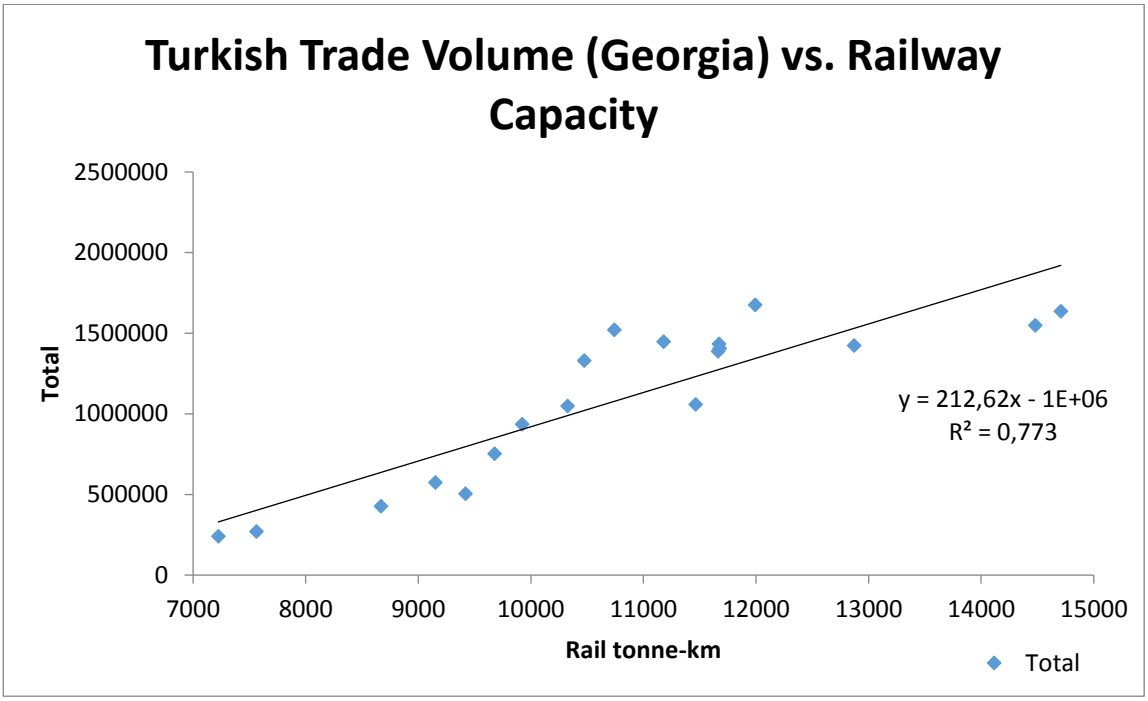

Fig. 21 Total Turkish trade volume with Georgia vs. railway capacity

Table 16. Regression Analysis Output for H5

Multiple R	0.88		
R Square	0.77		
Adjusted R Square	0.76		
Standard Error	237381.91		
Observations	19.00		
	Regression	Residual	Total
df	1.00	17.00	18.00
SS	3261917064085	957952946531	4219870010616
MS	3261917064085	56350173325	
F	57.89		
Significance F	0.0000007180		
	Intercept	RAIL	
Coefficients	-1206286	213	
Standard Error	306184	28	
t Stat	-3.94	7.61	
P-value	0.0010565847	0.0000007180	
Lower 95%	-1852278	154	
Upper 95%	-560294	272	

5.4 Turkish trade with China

For H6.1, the regression is made between volume of Turkish exports with China and the railway capacity. As shown in Table 17 below, the R-squared value of 0.68 shows the strength of the relationship between the variables. The value is statistically significant according to the ANOVA significance value (p-value) of 0.00. Thus, it is concluded that the capacity of the Turkish railway has a statistically significant effect on the Turkish export trade volume with China index by a coefficient of 457,000$ for every 1 ton-km, as Figure 22 and Table 18 below shows.

Table 17. The Results of Hypothesis H6

Hypothesis	Description	Regression R-Squared	P-Value / Significance F	Coefficient
H6.1	Turkey's Exports Volume (China)	0.684434598	0.000012	457.017743
H6.2	Turkey's Imports Volume (China)	0.60533701	0.000088	3368.20262
H6	Turkey's Total Trade Volume (China)	0.621592692	0.000061	3825.22036

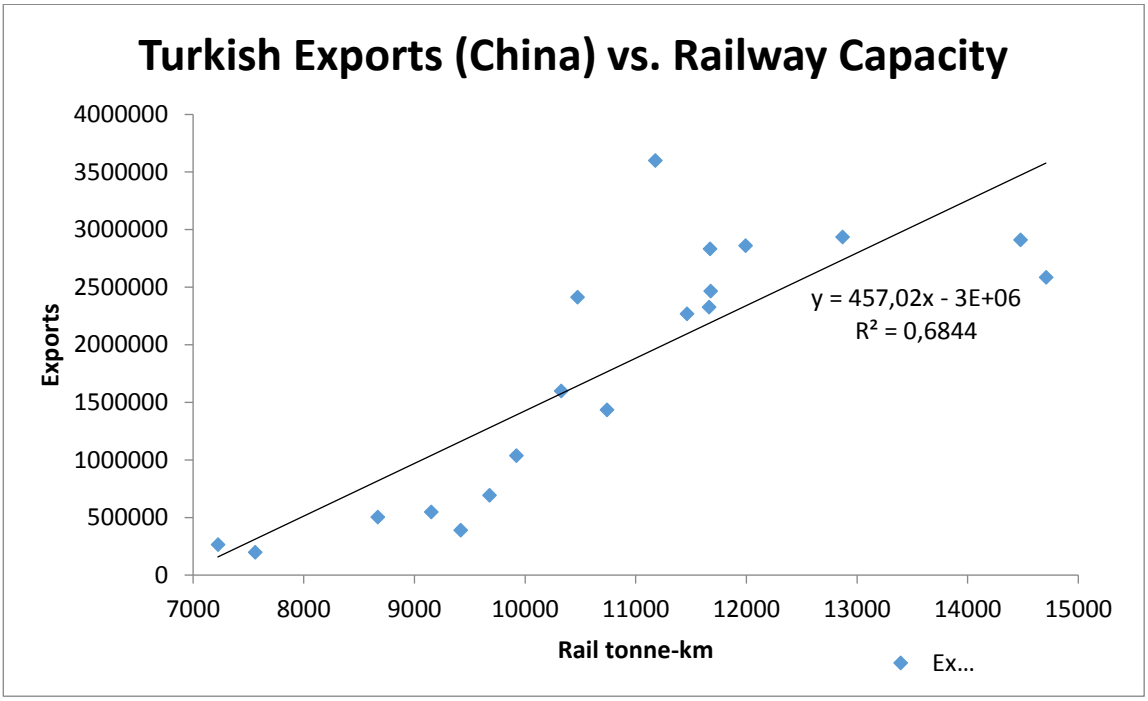

Fig. 22 Total Turkish exports with China vs. railway capacity

Table 18. Regression Analysis Output for H6.1

Multiple R	0.83		
R Square	0.68		
Adjusted R Square	0.67		
Standard Error	639321.74		
Observations	19.00		
	Regression	Residual	Total
df	1.00	17.00	18.00
SS	15070596257909	6948448801549	22019045059458
MS	15070596257909	408732282444	
F	36.87		
Significance F	0.0000124424		
	Intercept	RAIL	
Coefficients	-3143639	457	
Standard Error	824621	75	
t Stat	-3.81	6.07	
P-value	0.0013933827	0.0000124424	
Lower 95%	-4883437	298	
Upper 95%	-1403840	616	

For H6.2, the regression is made between volume of Turkish imports with China and the railway capacity. As shown in Table 17 above, the R-squared value of 0.60 shows the strength of the relationship between the variables. The value is

statistically significant according to the ANOVA significance value (p-value) of 0.00. Thus, it is concluded that the capacity of the Turkish railway has a statistically significant effect on the Turkish import trade volume with China index by a coefficient of 3,368,000$ for every 1 ton-km, as Figure 23 and Table 19 below shows.

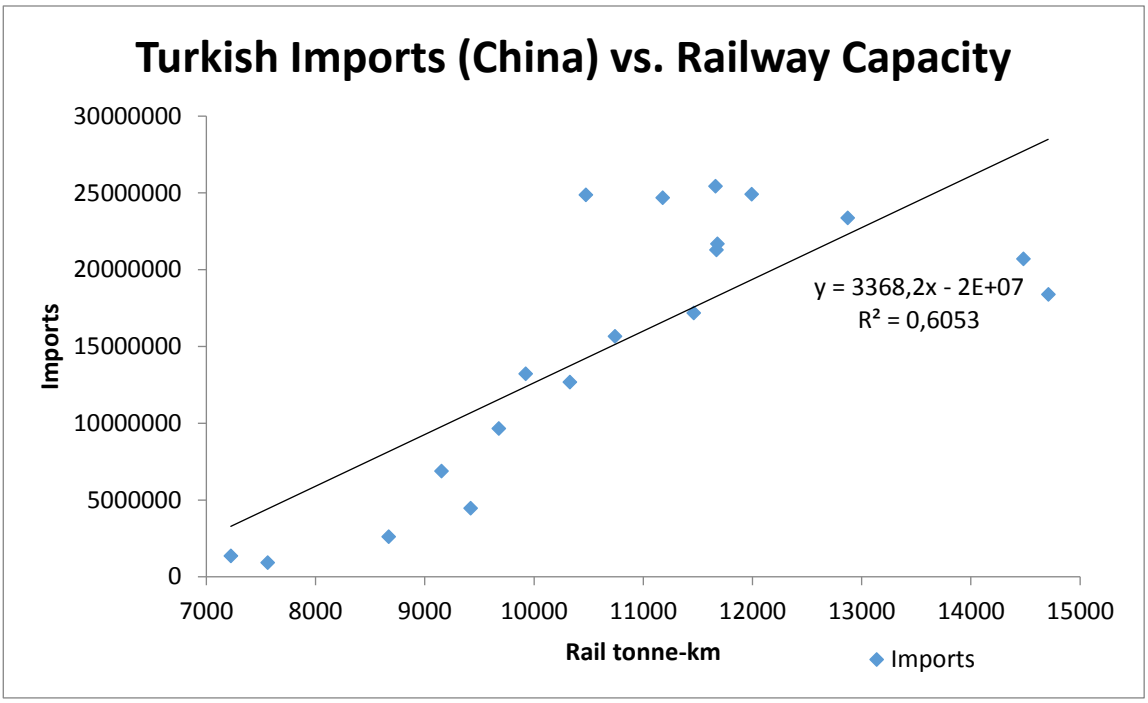

Fig. 23 Total Turkish imports with China vs. railway capacity

Table 19. Regression Analysis Output for H6.2

Multiple R	0.78		
R Square	0.61		
Adjusted R Square	0.58		
Standard Error	5602998.32		
Observations	19.00		
	Regression	Residual	Total
df	1.00	17.00	18.00
SS	818579250759963	533691033752310	1352270284512270
MS	818579250759963	31393590220724	
F	26.07		
Significance F	0.0000877721		
	Intercept	RAIL	
Coefficients	-21047768	3368	
Standard Error	7226958	660	
t Stat	-2.91	5.11	
P-value	0.0097041456	0.0000877721	
Lower 95%	-36295317	1977	
Upper 95%	-5800220	4760	

For H6, the regression is made between volume of Turkish trade with China and the railway capacity. As shown in Table 17 above, the R-squared value of 0.62 shows the strength of the relationship between the variables. The value is statistically significant according to the ANOVA significance value (p-value) of 0.00. Thus, it is concluded that the capacity of the Turkish railway has a statistically significant effect on the Turkish total trade volume with China index by a coefficient of 3,825,000$ for every 1 ton-km, as Figure 24 and Table 20 below shows.

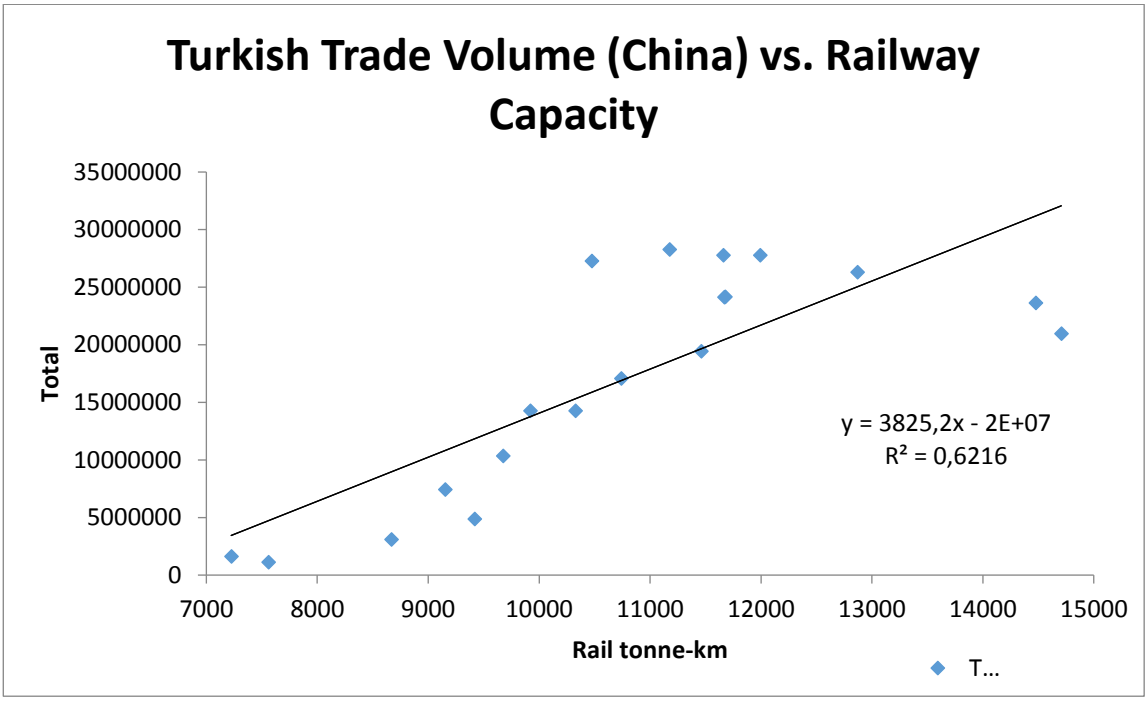

Fig. 24 Total Turkish trade volume with China vs. railway capacity

Table 20. Regression Analysis Output for H6

Multiple R	0.79		
R Square	0.62		
Adjusted R Square	0.60		
Standard Error	6148808.43		
Observations	19.00		
	Regression	Residual	Total
df	1.00	17.00	18.00
SS	1055789239231910	642733367003715	1698522606235620
MS	1055789239231910	37807845117866	
F	27.93		
Significance F	0.0000607015		
	Intercept	RAIL	
Coefficients	-24191407	3825	
Standard Error	7930965	724	
t Stat	-3.05	5.28	
P-value	0.0072353794	0.0000607015	
Lower 95%	-40924280	2298	
Upper 95%	-7458535	5352	

5.5 Turkish trade with silk road partners (Azerbaijan. Georgia, and China) aggregately: exports, imports, and total trade

For H7.1, the regression is made between volume of Turkish exports with China, Georgia and Azerbaijan, and the railway capacity. As shown in Table 21 below, the R-squared value of 0.63 shows the strength of the relationship between the variables. The value is statistically significant according to the ANOVA significance value (p-value) of 0.00. Thus, it is concluded that the capacity of the Turkish railway has a statistically significant effect on the Turkish export volume with China, Georgia and Azerbaijan index by a coefficient of 932,000$ for every 1 ton-km, as Figure 25 and Table 22 below shows.

Table 21. The Results of Hypothesis H7

Hypothesis	Description	Regression R-Squared	P-Value / Significance F	Coefficient
H7.1	Turkey's Exports Volume (Partners)	0.626123945	0.000055	932.993903
H7.2	Turkey's Imports Volume (Partners)	0.610431879	0.000078	3410.18995
H7	Turkey's Total Trade Volume (Partners)	0.625702722	0.000055165	4343.18385

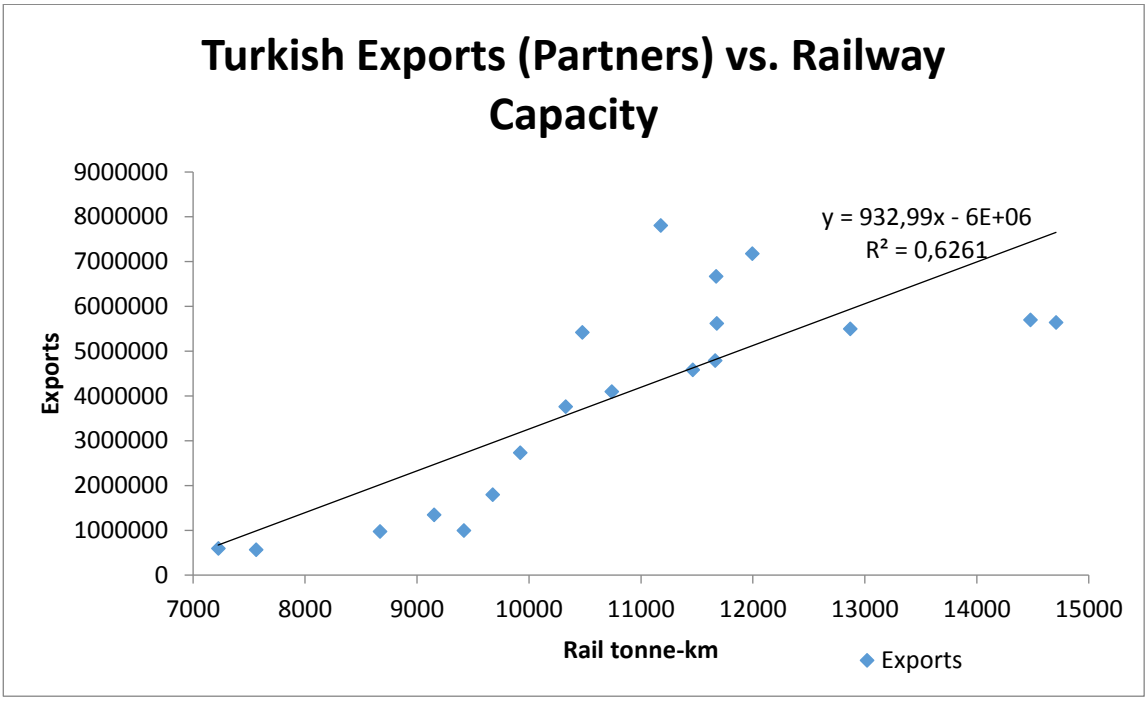

Fig. 25 Total Turkish exports with partners vs. railway capacity

Table 22. Regression Analysis Output for H7.1

Multiple R	0.79		
R Square	0.63		
Adjusted R Square	0.60		
Standard Error	1485320.48		
Observations	19.00		
	Regression	Residual	Total
df	1.00	17.00	18.00
SS	62809006515262	37505007958746	100314014474009
MS	62809006515262	2206176938750	
F	28.47		
Significance F	0.0000546243		
	Intercept	RAIL	
Coefficients	-6069155	933	
Standard Error	1915822	175	
t Stat	-3.17	5.34	
P-value	0.0056224365	0.0000546243	
Lower 95%	-10111186	564	
Upper 95%	-2027123	1302	

For H7.2, the regression is made between volume of Turkish imports with China, Georgia and Azerbaijan, and the railway capacity. As shown in Table 21 above, the R-squared value of 0.61 shows the strength of the relationship between the variables. The value is statistically significant according to the ANOVA significance value (p-value) of 0.00. Thus, it is concluded that the capacity of the Turkish railway has a statistically significant effect on the Turkish import volume with China, Georgia and Azerbaijan index by a coefficient of 3,410,000$ for every 1 ton-km, as Figure 26 and Table 23 below shows.

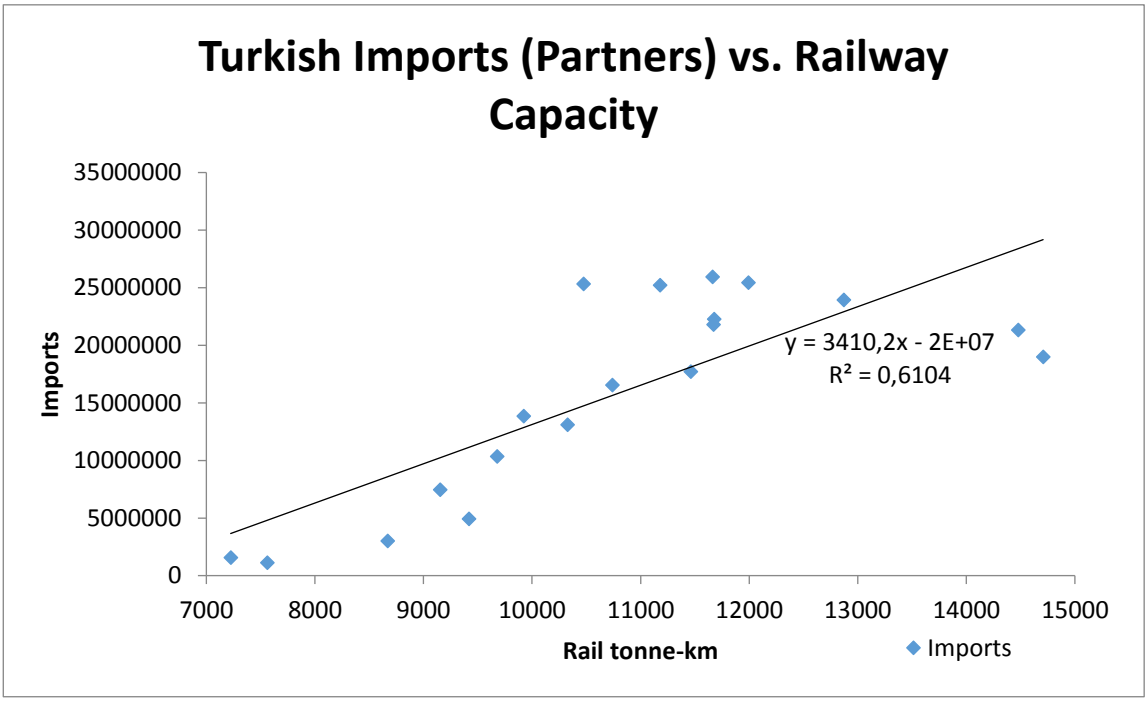

Fig. 26 Total Turkish imports with partners vs. railway capacity

Table 23. Regression Analysis Output for H7.2

Multiple R	0.78		
R Square	0.61		
Adjusted R Square	0.59		
Standard Error	5612538.95		
Observations	19.00		
	Regression	Residual	Total
df	1.00	17.00	18.00
SS	839114940360835	535510089362025	1374625029722860
MS	839114940360835	31500593491884	
F	26.64		
Significance F	0.0000783153		
	Intercept	RAIL	
Coefficients	-20981109	3410	
Standard Error	7239264	661	
t Stat	-2.90	5.16	
P-value	0.0099998443	0.0000783153	
Lower 95%	-36254621	2016	
Upper 95%	-5707597	4804	

For H7, the regression is made between volume of total Turkish trade with China, Georgia and Azerbaijan, and the railway capacity. As shown in Table 21 above, the R-squared value of 0.63 shows the strength of the relationship between the variables. The value is statistically significant according to the ANOVA significance value (p-value) of 0.00. Thus, it is concluded that the capacity of the Turkish railway has a statistically significant effect on the Turkish total trade volume with China, Georgia and Azerbaijan index by a coefficient of 4,343,000$ for every 1 ton-km, as Figure 27 and Table 24 below shows.

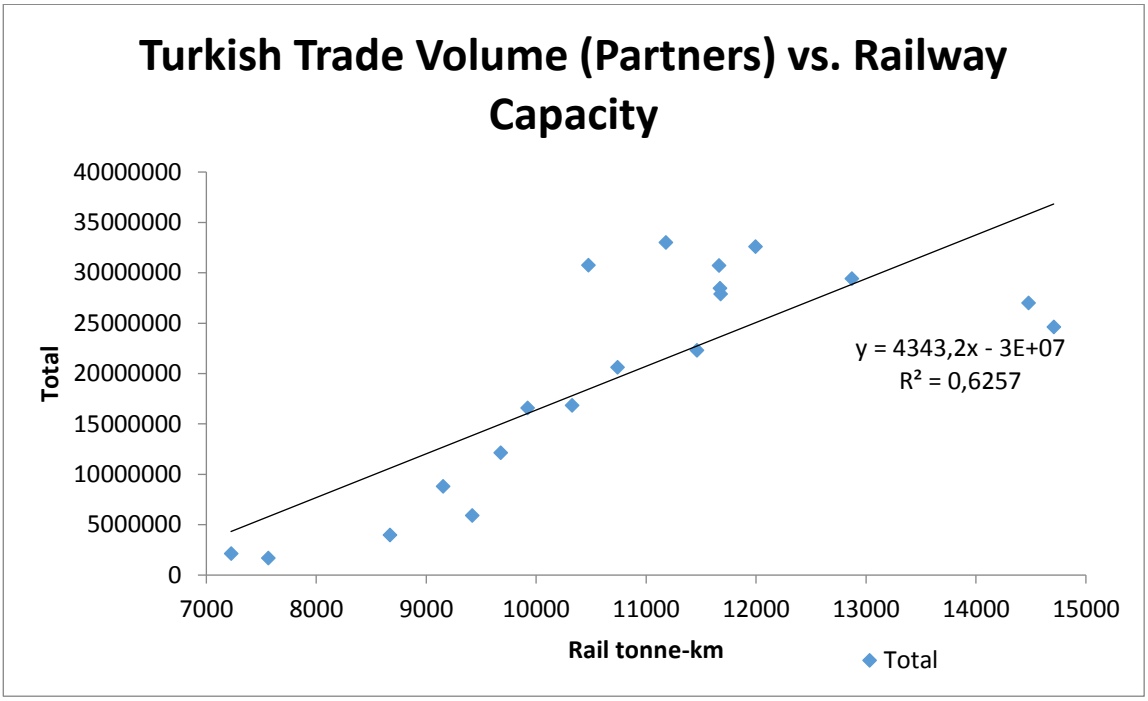

Fig. 27 Total Turkish trade volume with partners vs. railway capacity

Table 24. Regression Analysis Output for H7

Multiple R	0.79		
R Square	0.63		
Adjusted R Square	0.60		
Standard Error	6920543.81		
Observations	19.00		
	Regression	Residual	Total
df	1.00	17.00	18.00
SS	1361070876545360	814196752947704	2175267629493070
MS	1361070876545360	47893926643983	
F	28.42		
Significance F	0.0000551654		
	Intercept	RAIL	
Coefficients	-27050264	4343	
Standard Error	8926378	815	
t Stat	-3.03	5.33	
P-value	0.0075492223	0.0000551654	
Lower 95%	-45883275	2624	
Upper 95%	-8217253	6062	

CHAPTER 6

CONCLUSION

This chapter presents a discussion of the conclusion of the study as well as limitations and areas for future research.

6.1 Summary of findings

In Table 25 below, the result of the hypothesis are listed in order:

Table 25. Result of Hypotheses Suggested

No	Hypothesis	Result
Hypothesis 1	There is a statistically significant relationship between Turkish freight transport rail capacity (ton-km) and Turkish imports volume ($1000).	Supported
Hypothesis 1.1	There is a statistically significant relationship between Turkish freight transport rail capacity (ton-km) and Turkish imports volume of vehicles and accessories ($1000).	Supported
Hypothesis 1.2	There is a statistically significant relationship between Turkish freight transport rail capacity (ton-km) and Turkish imports volume of organic chemicals ($1000).	Supported
Hypothesis 2	There is a statistically significant relationship between Turkish freight transport rail capacity (ton-km) and Turkish exports volume ($1000).	Supported
Hypothesis 2.1	There is a statistically significant relationship between Turkish freight transport rail capacity (ton-km) and Turkish exports of vehicles and accessories ($1000).	Supported
Hypothesis 2.2	There is a statistically significant relationship between Turkish freight transport rail capacity (ton-km) and Turkish exports of Natural or cultured pearls, precious or semi-precious stones, or precious metals ($1000).	Supported
Hypothesis 3	There is a statistically significant relationship between Turkish freight transport rail capacity (ton-km) and Turkish trade volume ($1000).	Supported
Hypothesis 4	There is a statistically significant relationship between Turkish freight transport rail capacity (ton-km) and Turkish trade volume with Azerbaijan, a Silk Road partner ($1000).	Supported
Hypothesis 4.1	There is a statistically significant relationship between Turkish freight transport rail capacity (ton-km) and Turkish exports volume with Azerbaijan, a Silk Road partner ($1000).	Supported
Hypothesis 4.2	There is a statistically significant relationship between Turkish freight transport rail capacity (ton-km) and Turkish imports volume with Azerbaijan, a Silk Road partner ($1000).	Supported

No	Hypothesis	Result
Hypothesis 5	There is a statistically significant relationship between Turkish freight transport rail capacity (ton-km) and Turkish trade volume with Georgia, a Silk Road partner ($1000).	Supported
Hypothesis 5.1	There is a statistically significant relationship between Turkish freight transport rail capacity (ton-km) and Turkish exports volume with Georgia, a Silk Road partner ($1000).	Supported
Hypothesis 5.2	There is a statistically significant relationship between Turkish freight transport rail capacity (ton-km) and Turkish imports volume with Georgia, a Silk Road partner ($1000).	Not Supported
Hypothesis 6	There is a statistically significant relationship between Turkish freight transport rail capacity (ton-km) and Turkish trade volume with China, a Silk Road partner ($1000).	Supported
Hypothesis 6.1	There is a statistically significant relationship between Turkish freight transport rail capacity (ton-km) and Turkish exports volume with China, a Silk Road partner ($1000).	Supported
Hypothesis 6.2	There is a statistically significant relationship between Turkish freight transport rail capacity (ton-km) and Turkish imports volume with China, a Silk Road partner ($1000).	Supported
Hypothesis 7	There is a statistically significant relationship between Turkish freight transport rail capacity (ton-km) and Turkish trade volume with the three Silk Road partners: China, Georgia, and Azerbaijan ($1000).	Supported
Hypothesis 7.1	There is a statistically significant relationship between Turkish freight transport rail capacity (ton-km) and Turkish exports volume with the three Silk Road partners: China, Georgia, and Azerbaijan ($1000).	Supported
Hypothesis 7.2	There is a statistically significant relationship between Turkish freight transport rail capacity (ton-km) and Turkish imports volume with the three Silk Road partners: China, Georgia, and Azerbaijan ($1000).	Supported

As the results show, all hypothesis, except one, were statistically supported. Also, by examining each regression test's result, it is noticeable that, in general, export indices had stronger relationship with relatively higher R-squared values. Due to the nature of the regression test, a high R-squared value indicates that the tested relation can statistically explain a significant part of the variability in the dependent variable values. In this study, the positive relationship between railway capacity and trade indices in general, and export indices specifically, was statistically justified.

Some of the regression test results were also able to explain or support facts mentioned in the literature review. For example, it was explained that the Turkish government promises a significant increase in exports relative to imports in order to diminish the trade deficit. This particular claim was statistically justified with the

exports regression having relatively higher R-squared values and coefficients than imports.

Also, according to the literature review, the Chinese partner plays a relatively bigger role than Georgia and Azerbaijan. This was reflected on the trade regression made between Turkey and each of these countries. Moreover, Georgia and Azerbaijan showed weak or statistically insignificant relationship regarding imports into Turkey.

The main contribution of the study is the confirmation of the proposed positive effect of the BTK railway on Turkish international trade with countries along this corridor. As trade along the Silk Road railway develops, the effects on trade will become more prominent.

6.2 Limitations

The study had several limitations such as having the data for the past 19 years only, testing the effect of BTK that has recently started operating, only regression test was made, and as trade volume was measured in US dollars, the inflation in exchange rate was not put into consideration.

Future research is proposed to overcome the above mentioned limitations of the study.

6.3 Future study

Future research is proposed to overcome the mentioned limitations of the study. Regarding the inflation rate, taking it into consideration can increase the contribution of such a study. Looking back at the literature, inflation rates can be used as dummy variables. Moreover, the results of the study can be further investigated. For

example, the statistically insignificant relationship between the railway capacity and Georgia's imports volume could be due to other interesting factors, unseen by this particular study. Furthermore, a gravity model could be undergone for this study, in order to predict trade flows based on the economic sizes and distance between the 4 countries chosen in this research. Another interesting addition might be examining more product categories in a detailed view.

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