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Applying Gravity Model in International Trade to China's OBOR Policy Initiative

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Abstract
China's New Silk Road project is a large and ambitious project, but it has been operational though far from completion. It involves building transportation and communication infrastructures, to include digital commerce. The purpose of this essay is to assess how much trade is created in China's Belt and Road project spanning countries in West Asia, Western Europe and other significant Belt countries. China aims to be the largest economy in the world. Will the New Silk Road make China realize the "Chinese dream"?In this essay, we described the concept of the Gravity Model, how this can be used to analyze international trade activities and determine China's level of growth.Before we delve into the quantification of the benefits, we have to explain first the Gravity model and other significant facts about China's "One Belt, One Road" project. At the end of the essay, we provide a detailed analysis of the trade created by the Belt Road countries, and concluded that economic size of China, along with the economic sizes and market sizes of foreign partners and cultures of have huge impact on bilateral trade flows between China and the Belt Road countries.
Keywords: gravity model, China OBOR, international trade.

1. Introduction

Chinese government successively projected the Silk Road Economic Belt and the 21st Century Maritime Silk Road initiatives that are collectively known as the One Belt One Road Initiative, The initiative aims to connect China with the other countries in Europe and Asia through infrastructure, trade and investment, and bases on the standard of Comparative advantage that urges nations to engage in true free trade and to specialize in areas where they have the highest comparative advantage.

From the perspective of international trade theories, The Belt and Road initiative help advance and assist the free trade across- boarders and to destination because without an effective infrastructure with proper co-operations, the economic activities cannot take place So The Belt and Road initiative create more opportunities as well as make international trade more suitable for China and other countries.

On the other hand, there are risks and concerns about this project; the concern about the low-quality of Chinese construction is one of them. Another is the concern of the multitude country toward the effect of Chinese workers that would come to their country to build and manage infrastructure projects.

In the long run, Belt and Road initiative is good for Chinese Economy and The One Belt One Road initiative has a major impact in both China's domestic front and internationally.

Domestically, it could stimulate China domestic economic growth. Internationally, OBOR initiative would increase connectivity between China and the rest as well as create new markets for Chinese products and services; these would increase Chinese goods exporting The Overall.

OBOR initiatives cause a rise in China's GDP; in additional it would also create higher demand for Chinese currency (RMB) which causes the price of Yuan increase, and is creating major opportunities and winners for Chinese state-owned enterprises, especially those involved in transportation infrastructure, railway construction, energy and resources exploitation, cultural tourism, informational technology, and economic firms.

Asia for Connectivity and China's One Belt One Road initiative share some similarities, Both focus on transport connectivity as a way to bring part or participating countries closer to one another, facilitating better access for trade, investment, tourism and people-to-people exchanges.

For Europe, Europe standing at the endpoint of both Belt and Road is one of the focus points for China in developing greater cooperation.

Europe is primarily a market For China, Similarly the motive that Europe cooperate with China under One Belt One Road initiatives because China have money to fulfill the EU Infrastructure Investment Plan (EU-IIP).Additionally Europe Economy today is weaker than ever before, So it is the good opportunity for Europe to become stronger by exporting goods to Chinese market.

So The Chinese OBOR initiative presents the EU with unique opportunity of cooperation and mutual benefits to re-enter the great game bringing together its own best practices with Chinese led economic growth, infrastructural development and capacity building.

Some certified sources point to the involvement of at least 63 countries, including 28 European countries. Mainly related for Europe is that the Road ends where the European Union (EU) starts. Most significantly, this massive bloc between the EU and China accounts for 64 percent of the world's population and

30 percent of global GDP.

One of the Belt and Road's key objectives is to ease bottlenecks for cross-border trade, in particular through transport infrastructure.

This should decrease the cost of transportation, thus stimulating trade between China and these countries. The same effect should be expected for the other end of the road because cheaper transportation should also encourage its trade with other Belt and Road countries, as well as with China.

These study procedures empirically whether the reduction in transportation costs shipping or railway costs will have an optimistic impact on trade flows for Belt and Road countries and, most importantly for EU countries.

In addition to estimating the size of the trade gains stemming from a reduction in transportation costs, we explore the possibility that the Belt and Road may eventually go beyond its current objectives towards the creation of a free trade region. We establish a scenario in which China embarks on a free trade agreement (FTA) with the 63 countries of the Belt and Road initiative. In other words, we try to identify empirically what kind of trade gains countries could expect from a reduction of transportation costs and to compare them with potential trade gains from reductions in tariffs stemming from a potential FTA. While our analysis estimates gains/losses for a large number of countries.

2. Methodology

2.1 The Gravity Model

The effect of the Belt and Road initiative is estimated using a conventional gravity model, which is standard in modern trade policy evaluation. The advantage of the model is that it provides an explicit form for various types of trade cost. It is easy to compare transportation cost and time with the other types of trade cost. Additionally, the model has a rigorous theoretical background and can analyse not only the bilateral effect of transportation time and cost change, but also their spillover effect on the other countries.

To estimate the model we specify the trade between any two countries as a function of their log GDPs, tariffs, log transportation time and cost between them, and other control variables.

In these model only two independent variables are introduced including GDP and distances. The model in this study is further enhanced by adding the variables of population, exchange rate, culture and strategic partner that affect bilateral trade between china and the partner countries

The gravity modelling has been used to determine the level of growth in China's trade with most countries in Asia, Africa and Europe. China's size and strategic location have made it well integrated into the world economy. Edmonds et al (qtd. in Johnston, Morgan, and Wang 921) indicated that China has intense knowledge in foreign trade and in different partners across the globe.

Focusing on the gravity theory, distance has negative effect on trade flows, but partner income has positive relation (Johnston, Morgan and Wang 921). The gravity model contains a role of income, specifying that countries with higher income will trade more. Trade between two countries is somewhat similar to the gravitational force between two objects: "directly related to the countries' size (or income), and inversely related to the distance between them" (Cyrus 6).

The gravity model is expressed in the following equation (1):

$$In(Tradeijt)=b0+b1\ In(Yit)+b2\ In(Xjt)+\ b3\ In(NIt)+\ b4\ In(NJt)$$
$$+b5\ Tariffij\ +\ b6.1\ In\ (Rial\ Cij)\ +\ b6.2\ In(Air\ Cij)\ +\ b6.3\ In(Ocean\ Cij)$$
$$+\ b7\ Controlsij(EXIJt\text{-}CIJt\text{-}PIJt)\ +eijt$$

Where ij, refers to export values from country i (china) to country
j (partner countries).
(Tradeijt): china's trade with country j in year t.
(Yit): is the GDP of china in year t.
(Xjt): is the GDP of the partner country j in year t.
Tariffij, (Rial Cij), (Air Cij) , (Ocean Cij) are bilateral tariffs, railway transportation costs, air costs and maritime costs that have been adjusted for the multilateral resistance factors.
Other control variables are population, exchange rate, Culture dummies variable, Strategic partner dummy variable (NIt), (NJt), Controlsij (EXIJt-CIJ-PIJt) perceptively, where:
NIt: china's population in year t.
NJt+: Population of country j in year t.
EXIJt: Exchange rate between china and country j in year t.
CIJt: Culture dummy variable for the cultural gap between china and country j .
PIJt: Strategic partner dummy variable for the strategic partnership between china and country j in year t.
eijt: Error term.
Ln contains all natural numbers positives and negatives, log contains positive numbers.
Ln(x)=loge(x), e=2.718.

We consider three types of transportation mode in international trade: ocean, airplane and railway. Although road is also a very important type of transportation mode, we do not include it in the thesis for two reasons. First pure road transport is only relevant for short-distance trade, and in most cases, road transport complements railway transport to facilitate international trade.
Second, road driving distances between countries are very similar to railway distance, thus putting them together usually leads to serious problems. Thus we write TCij in the following form,

$$In(TCij)=a1\ In(Rial\ Cij) + a2\ In(Air\ Cij) + a3\ In(Ocean\ Cij)$$

Where α1, α2, α3 represent the differential impact of each transportation mode on total transportation cost.

Gravity models are almost always estimated using ordinary least squares. This poses a problem since the causality between income and grade is not precise. The gravity equation states hat high income causes high trade, but perhaps it is trade that instead causes income to be high. Conversely, it is also possible that another factor, such as free-market government policies, pushes up both income and trade. In that case, the gravity equation is misspecified, for income will be correlated with the error term in the regression. In other words, ordinary least squares will not provide consistent estimates. Instead, the OLS estimates will overstate the importance of income.

In addition, the bias to the income coefficient may also bias the other coefficients in the equation: it cannot be assumed that any of the OLS coefficients can be reliably estimated.

Wei (qtd. in Cyrus 8) uses population and its square to instrument for income in a gravity model, whereas Harrigan uses factor endowments to instrument for production in a fixed-effects model of import spending.

Some empirical studies of growth rates across countries find that the ratio of exports to GDP, or some other measure of openness, is a significant determinant of growth (Cyrus 29). This is particularly applicable for China and other Asian countries.

A typical specification begins with the standard determinants of GDP suggested by neoclassical growth theory, and adds a variable for exports as a share of GDP. For example, Feder (qtd. in Cyrus 30) used regression to determine growth rates for 31 semi-industrialized countries over the period 1964-1973 using three variables: "investment as a share of income, the rate of growth of the labor force, and the rate of growth of exports (times exports as a share of income)" (Cyrus 31). The coefficient on this last variable is highly significant statistically. Likewise, Edwards also used regression to determine the rate of growth of total factor productivity on two measures of openness – total trade as a percent of GDP and total tariff revenue as a percent of trade – along with some other variables, and finds that "in every regression the proxies for trade distortions and openness are highly significant" (31).

2.2 Data description:

One of our key challenges was how to measure transportation costs between two countries and which assumptions to make in terms of the future reduction of such transportation costs because of the improvement in infrastructure resulting from the Belt and Road initiative.

For the measurement of transportation costs, we focus on sea, road, railway and air distance between any two capitals. We use several different databases, namely SEARATES for sea transportation and ROME2RIO and Google Maps for railways and roads. Regarding our purpose variable, bilateral trade, we use data from a variety of sources. UN Comtrade and CEPII for our bilateral trade pairs.

Based on data availability, our sample consists of 16,748 country-pairs for 137 countries, including all 28 EU countries, 63 Belt and Road initiative countries, and a number of major economies outside Eurasia.

We only use country exports to measure bilateral trade value and to measure transportation costs we rely on traditional index of distance, we calculate ocean, road, railway, and air distances for the corresponding cost of each transportation mode for any two capitals as proxy for countries.

- Ocean distance is obtained from www.searates.com , which reports regular shipping distance between any two cities including both the within –country transportation distance and across countries transportation distance.
- Air distance is providing by the geographic distance between the two countries. To that end, we calculate the population-weighted distance between large cities in the two countries. The source is CEPII.
- Railway distances are not readily available in any existing database. We first calculate the distances from Rome2Rio10. We insert the name of each capital (of the country) as the starting and destination in Rome2Rio respectively, then choose railway transportation, and finally get the distance of the railway route. Some routes may require transfer via bus or metro, so we connect these countries if railway comprises a major way of transportation. Trans-continental routes from Asia to Europe, which are crucial to our analysis, are not available in Rome2Rio. To fill in the trans-continental routes we rely on

United Nations (1999), which gives railway distances for 16 major cities in Europe and Asia, and we connect these lines to the other city of Europe by adding distances of related cities from Rome2Rio.

- A number of other control variables from various sources are also included in this dataset. The GDP (expressed in dollars) for exporting and importing countries come from the World Bank WDI datasets. The product-level bilateral ad valorem tariff data is extracted from the TRAINS/WITS and the MACMap databases, developed jointly by ITC (UNCTAD-WTO, Geneva) and CEPII (Paris), and is aggregated to country-level weighted by the trade value from the last year. Other control variables, including contiguity, common currency, common legal origin, and colonial relationship, are obtained from the CEPII GRAVITY dataset.

3. Literature Review

Focusing on the gravity theory, distance has negative effect on trade flows, but partner income has positive relation (Cyrus ,Johnston, Morgan, and Wang). higher income will trade more.

(Cyrus) uses population and its square to instrument for income in a gravity model, Some empirical studies of growth rates across countries find that the ratio of exports to GDP, or some other measure of openness, is a significant determinant of growth .

Edwards also used regression to determine the rate of growth of total factor productivity on two measures of openness – total trade as a percent of GDP and total tariff revenue as a percent of trade – along with some other variables, and finds that "in every regression the proxies for trade distortions and openness are highly significant".

Timbergen who first applied gravity model to analyse foreign trade flows in 1962. In his model, while dependent variable is the trade flow between country A and B, GDP and geographical distance are independent variables, The final estimated results showed that as opposed to distance, the GDP variable has positive effect

Rahman (2009): attempts to investigate trade potential for Australia using gravity models. His results reveal that trade is affected positively by economic size, GDP per capita, openness and common language, and negatively by the distance between the trading partners.

Gu (2008) conducted a gravity analysis on commodity exports from China to 30 OECD countries for the period 1999 to 2005. The empirical results indicate that the traditional explanatory variables, GDP, GDP per capita and population have strong positive effects on China's export trade, while distance and remoteness provided adverse impacts.

Hanouz,Geiger and Doherty, 2014:to promote and facilitate the free trade in goods across- boarders and to destination, the countries should implement the policy that endorse the four features: market access, boarder administration, business environment, communication infrastructure, and transportation infrastructure.

Banister and Berechman, 2001: The transportation infrastructure and related services play important role in the flow of international trade.

Rodrigue and Notteboom 2014: High density transport infrastructure and highly connected networks are commonly associated with High levels of development. When transport systems are efficient, they provide economic and social opportunities and benefits that result in positive multipliers effects such as better accessibility to markets, employment and additional investments.

Karluk and Karaman, 2014: The study contributes to international trade theory. International trade originates from ancient times. Trade flows outline transportation routes. The major routes from Asia to Europe were trailed when Europeans discovered Chinese silk and Indian spices the routes are known respectively as the Silk Route and the Spice Route. The routes appeared to be a powerful stimulus for development of political and economic relationship among countries and civilizations, facilitated exchange of goods, cultures, knowledge and skills.

Eaton and Kortum 2002: propose ideas that relate international trade and distances between countries. These are namely: (1) decline of trade caused by increase of geographical distances, and (2) increase of cost difference caused by increase of distance.

Ghemawat 2001: refers to distance in senses of cultural differences, differences in administrative and political sense, in sense of geography, and in sense of economic development.

Sandberg, Seale and Taylor used a gravity model approach to investigate the effects of regional integration.

Coyle: Transportation is the physical thread connecting the company's geographically dispersed operations. More specifically, transportation adds value to the company by creating time and place utility; the value added is the physical movement of goods to the place desired and at the time desired.

Finger & Yeats (1976): affirm that transportation cost "tend to protect domestic producers from foreign competition as do such artificial barriers as import quotas, tariffs. Actually transport costs, like tariffs, influence the magnitudes of trade flows, and types of goods exchanged internationally.

Limao & Venables (2001): observe the real costs of trade -the transport and other costs of doing

business internationally are important determinants of a country's ability to participate fully in the world economy. Remoteness and poor transport and communications infrastructure isolate countries, inhibiting their participation in global production networks.

Martinez-Zarzoso et al. (2003) emphasize the proven impact of infrastructure on transport costs and trade points towards the importance of investing in new port infrastructures as a way of fostering trade and income in developing countries.

Regmi and Hanaoka (2012): emphasize that transit railway infrastructure is highly important for landlocked countries, as it serves them to gain access to open seas.

Contessi (2016): assumes that the "oldest" initiative dates back to 1992, the first project was connecting Asia to Europe by constructing highways net with total length of 141 271 km. The project was meant to connect railways of Europe and Asia and to provide better access to sea ports for landlocked countries.

The gravity model for international trade is studied by many authors . These researchers developed the framework of gravity to measure the bilateral trade and introduced the theoretical background of gravity equation in trade studies. Although there are a significant numbers of theoretical studies that support gravity trade model, there is a lack of studies supporting gravity transportation model. In addition, transportation bilateral data is not available as trade data.

Consequently, in this study we tried to propose some theoretical background of transportation gravity supported by some empirical evidence with the data in hand because there is few authors have been interested mainly in applying gravity models to answer questions concerning politics, institutions and trade flow.

4. China's GNP Growth

Trade flows are determined by finding the GNP of the exporting and importing countries. China has experienced tremendous economic growth since 1978 when it entered the world market. Country size is directly proportional to the volume of trade flows; thus, the larger the GNP, the more trade inflows (Anderson).

Country size is a predictor of trade flows as compared with distance or proximity between exporting and importing countries. The biggest economic partners in the EU are large economies such as Germany, Britain and France, whereas the biggest trade partners of EU are also large economies like the U.S., China, Japan and Brazil (Megi 149).

Moreover, openness is an important contributor to growth in many countries, particularly China and Singapore (Cyrus 40). The contribution of openness to growth is a contribution of trade as predicted by the gravity model: thus, it cannot be attributed to policies (Cyrus 40).

Cyrus found in her dissertation that openness explains the large amount of growth for Hong Kong and Singapore, and positive (though smaller) amounts also for Korea, Malaysia, and Taiwan. In the Philippines, where growth was lower than the world average, a low level of openness explains almost half this gap. Low openness detracted from the growth accomplished by China, Indonesia, Japan, and Thailand. Of the other variables, investment and education are the dominant determinants in most of the countries (Cyrus 40).

For Korea, Hong Kong, and Taiwan, the helpful effect of openness is fully predicted by the gravity model. For Singapore and Malaysia, on the other hand, the contribution of predicted openness is smaller than the contribution of residual openness, presumably attributable to outward-oriented policies (Cyrus 41).

Almost all countries have a large positive unexplained component, however, suggesting for one's favourite stories about Confucianism, political stability, or government policy. The exceptions are China, where catch-up from a low initial GDP explains most of the growth, and Singapore.

5. China's Openness Policy

Economists posit that openness, mostly via international trade and FDI, is one of the major determinants in economic growth and welfare. Since its inception of the openness policy in 1978 associated with international trade and FDI, the country has been maintaining remarkable annual GDP growth, mostly over the period of 1990-2001. Openness, income, and economic growth in China, and the relationship among them have long been the hot topics among economists.

Openness or open market-policy in China resulted into many positive outcomes for China's economy. Frankel and Romer (qtd. in Wang 1) use geographic features of countries to construct a component of trade openness in their cross-country study on the relationship of trade and economic growth. Their basic strategy is to create an instrumental variable (IV) for trade by developing a formula using bilateral trade. They concluded that the IV estimate of the effect of trade on income for 1985 is positive and substantial (Wang 2).

There are two significant features in China's opening up process. First, due to regional differences in geographic traits, the level of participation in foreign trade highly varies from one province to another. Second, though China has maintained substantial inflows of FDI since the 1990s, the distribution of FDI across provinces is significantly different (Wang 2).

Most economists view the policy changes of the Chinese government in 1978 as the triggering

mechanism of China's subsequent economic growth. These policy changes fit into two general categories: (1) international reforms in the incentive system, (2) external openness for free trade, FDI and the introduction of foreign advanced technology and managerial knowhow.

Before 1978, the Chinese economy was centralized and planned by a central government, in which all firms were state-owned. Workers were the lowest paid in the world, with no incentives to work overtime and engage in production with available inputs. Firms were discouraged to more forward, update their technology while workers were not motivated to suggest for improvement and success of firms. Competition was very low. Therefore, the productivity and performance of the whole economy was very low. Beginning in 1978, the Chinese government addressed this problem by taking many international reforms to enhance the incentive system, from the initial individual contract system to the recent privatization of state-owned enterprises (SOE) and the joint stock system of SOE, which allows SOEs to issue their stocks to the public. However, most analysts believe that China's rapid growth over the last decade has been due to the globalization effect initiated by China's openness policy.

China's open-door policy consisted primarily of a reduction of trade tariffs and non-tariff barriers, an expansion of the domestic market of trade tariffs and non-tariff barriers, and an expansion of the domestic market for international trade and FDI. The data from the National Bureau of China Statistics (NBCS) (qtd. in Wang 8), China's exports have surged from US97.5 billion in 1978 up to almost US $1,950 billion in 1999, while imports have grown from just under US $120 billion in 1978 to over US $1,650 billion in 1999. On the other hand, the flow of FDI actually utilized in China began to take off from US$4,366 million in 1991 to US$11,007 million in 1992, and maintained a substantial growth until 1998 followed by its peak at US$46,878 million in 2001 (Wang 9).

6. China's "One Belt, One Road" Policy

China's "New Silk Road" policy is also known as "One Belt, One Road" (OBOR) project (Lo 54), a political and economic strategy and brain-child of Chinese Premier Xi Jin ping. Xi and his economists believe that China's economic size and the economic sizes of the countries in the New Silk Road will catapult the country as the new economic powerhouse of the world. China is the focal point of the "One Belt, One Road" project, but still China needs the support of the economies and governments participating in this large, economic endeavour. Probably, this is Beijing's counterpart of the American dream because the set of policies are in consonance to the policies set by President Xi and the "Chinese Dream," which aims to realize national and personal ambitions. In sum, it wants to create an economic superiority that will benefit both the state and the Chinese people. The Chinese populace, the local governments, the different agencies of government, and the provinces are all geared to make the New Silk Road fully "passable".

The New Silk Road will open or connect a regional infrastructure spanning China and the countries in Asia, Europe and Africa through land and sea, and stimulate/boost the use of China's currency by constant use in both trade and financial transactions (Lo 54). Moreover ,the OBOR is used to strengthen China's economy and quest for world economic supremacy by way of "consumption-led growth", and politically, it is used to acquire foreign trade relationships in response to trade agreements in which China has been side lined (Lo 54).

The OBOR sea and land infrastructure involve the development of ports and key hubs, e.g. construction of facilities in Australia, Sri Lanka, Malaysia, Tanzania, Kazakhstan (Central and East Asia), and ports with access in the Indian Ocean to be connected to the Greek Port in Pireaus. Chinese consortiums have a key role in this international infrastructure activity (Wade) with China as the focal point.

OBOR Triggers Local and International Trade and Investment

In Shanghai, OBOR plan is focused on financial services, trade investments, infrastructure construction and stimulating cultural activities. The government and domestic businesses are keen on attracting foreign business by reducing red tape, simplifying and streamlining business applications for foreign investors, giving government incentives to encourage the service sector, and stimulating multinational corporations to expand the activities of their regional headquarters now positioned in Shanghai (Yanling).

Fugian province is the focal point of the Maritime Silk Road of OBOR, which is the maritime aspect that includes significant shipping channels that connects the different ports of Southeast Asian countries. Fugian's part also includes infrastructure construction to enhance the shipping and logistics sectors (Yanling).

Guandong province is another key partner in the Maritime Silk Road, that also includes economic and trade partnerships with international corporations, and cooperation with Hong Kong and Macao. Guangdong is developing world-class amenities for ports in Shenzhen and other key cities.

Moreover, Xian is focused on being the starting line of the Silk Road Economic Belt, considered the land-based "belt" of OBOR. It is likewise developing transportation infrastructure (e.g. roads and bridges) and facilitating the construction of an air freight port and other significant infrastructure. Xian has recently created the Silk Road Chamber of International Commerce which has a key role in OBOR activities and functions (Yanling).

Xinjiang's part is focused on the sea corridor in Central Asia by building transportation infrastructure. Speed trains are in the process of construction in Kazakhstan to connect with the province. It is also facilitating the development of digital infrastructure and allied technologies (Yanling).

Trade Created by OBOR

This is a labor-intensive project, so it creates jobs in the routes and the countries involved. These countries will become a part of the interconnection of a global supply chain. New business opportunities, new products in an innovative supply chain are part of what to expect.

Xi's government wants the world to realize that this is not a concept or idea that has remained in the imagination of the Chinese government: The New Silk Road is already a reality and not a fluid concept. Trade is going on among countries in the OBOR, although the project is far from complete. It is backed by "Chinese hard currency" and consists of several projects and opened to all countries that would like to participate (Guluzian 135). What China and the Belt countries can benefit from the New Silk Road is the availability of "hard" infrastructure projects, such as roads, railways, and pipelines, but also including soft projects or the advantage of digital commerce. Trucks, speed trains, pipelines will be the main instruments or tools to carry cargo and products to and from the Belt countries.

Beijing fleshed out an initial $40 billion Silk Road Fund in December 2014 that will be used for investments and to be made available for the countries and private entities or multinationals participating in the OBOR. Other resources come from the State Administration of Foreign Exchange and state-controlled corporations and entities like "the China Investment Corporation, the Export-Import Bank of China, and the China Development Bank" (Guluzian 136). Another important milestone is the creation of the Asian Infrastructure Investment Bank, a China-led initiative, which is a multinational financial organization to help countries in financing and other construction projects of the New Silk Road. This is comprised of 57 countries like Germany, the UK, France, and Russia, and has an initial capital of $100 billion. The overall cost of the infrastructure projects will exceed $1 trillion, but banks and host governments have been asked to help in financing, such as the European Bank for Reconstruction and Development, the World Bank, and the Asian Development Bank (ADB), and other private financing institutions.

Great amount of trade from more than 60 countries participating in the New Silk Road will be an overall outcome, but most significant is the fostering of development in economically depressed areas of the world. Cost of transportation for agricultural produce and other global products will be greatly reduced out of the transportation infrastructure created by the OBOR.

China's size, in terms of GDP and GNP, affects bilateral trade flows. China has established trading relations with more than 200 countries and regions throughout the world. Economic size of trading partners also influence trade relations with China. For example, China's trading partners include the United States, Hong Kong, Japan, South Korea, Germany, the Netherlands, the UK, Singapore, Taiwan, and Italy. These countries account to about 69.40 percent of China's exports. Most of these countries are also importing partners, to include Australia, Thailand, and the Philippines, and together they account to about 62.26 percent of China's imports in 2005 (Wu, Chen and Chen 113). The data is shown in the table below.

Table 1 China's Top Trading Partners in 2005 (US$ Million)

Rank	Exporting Partners	Volume	Importing Partners	Volume
1	USA	162.939	Japan	100.468
2	Hong Kong	124.505	South Korea	76.874
3	Japan	84.097	Taiwan	74.655
4	South Korea	35.117	USA	48.735
5	Germany	32.537	Germany	30.668
6	Netherlands	25.876	Malaysia	20.108
7	UK	18.983	Singapore	16.531
8	Singapore	16.716	Australia	16.147
9	Taiwan	16.559	Thailand	13.994
10	Italy	11.695	Philippines	12.870

Source: China Customs Statistics (qtd. in Wu, Chen and Chen 113)

The table shows China's trading partners and the volume of trade. Economic size of trading partners influences its trade relationship with China as an exporting country. The United States, which is the world's largest economy, is China's largest exporting country, while Japan is the largest importing partner. However, the U.S. is not a Belt Road partner. Hong Kong is the second largest because of culture, is a long-time trading partner being a part of China, and also being the number one advocate of the OBOR strategy. Wu, Chen and Chen also found that the cultures of the Belt Road countries positively influence bilateral trade, but distance between China and the countries have had no significant effect on trade flows.

7. Results

7.1How responsive is trade to transportation costs:

Our results show that a reduction in transportation costs has a statistically significant and positive impact on international trade. We report the best of our results namely those that take into account third-country effects, including the multilateral resistance, as well as all control variables.

We find that reduction in railway, air and maritime costs increases trade. In other words, transportation costs are found to be statistically and economically significant in fostering international trade.

Next, we move to comparing the impact of a reduction in transportation costs to a reduction in tariffs for international trade. This is a very relevant since we could think of the Belt and Road initiative as a sort of substitute free trade agreement as long as reductions in transportation costs are as effective in fostering trade as is dismantling tariffs. It is an important issue for China which has long feared being excluded from the largest and most relevant trade deal in the Pacific, The reduction of transportation costs in an area as vast as the Belt and Road area should help reduce China's worries about TPP as long the infrastructure that is being built does create new trade opportunities.

7.2 Simulating the impact on trade of a reduction in transportation costs.

Belt and Road initiative is still in its early phases obliges us to use a simulation exercise to understand what its impact might be on international trade. As in any simulation exercise, there is uncertainty around the hypothesis behind the simulation. In our case, in particular, it is clearly difficult to estimate how much transportation costs will be reduced as a result of the improvement in infrastructure. All of the top winners are located in Europe, with eight of them within the EU.

And the top ten losers, all of which are outside Europe and Asia. This looks like a very logical finding because the rest of the world will not benefit as much from the improvement in infrastructure.

In any event, trade losses are rather minimal so the impact is more about not gaining trade rather than losing trade. In fact, the negative impact on trade is less than 0.2 percent even for the biggest losers. Asian countries are not found to be among either the biggest winners or losers. This is probably explained by the fact that the estimated reduction in maritime transportation costs is quite moderate.

The EU is the biggest winner from the Belt and Road initiative, with trade. Trade in the Asian region is also positively affected by the reduction in transportation costs, but only by half as much as the EU, with trade increasing. Conversely, the rest of the world suffers from a very slight reduction in trade. The findings by region basically confirm our analysis at the country level. As a whole, our results point to the Silk Road being a win-win in terms of trade creation because the gains from EU and Asia clearly outweigh the loss felt by the rest of the world.

7.3 simulating trade gains from establishing a free trade agreement within the Belt and Road area.

The five biggest winners from the establishment of a free trade agreement within the Belt and Road area, and compares their trade gains with those obtained from reduced transportation costs. The biggest winners are Middle Eastern and central and East Asian countries, with trade increases.

This compares favourably with the trade gains of 3 percent stemming from a reduction in transportation costs that were estimated for this group of economies. EU countries, whose trade gains were the largest under the reduced transportation cost scenario, would now experience weak losses. The result is intuitive, because the EU countries would be outside the Belt and Road free trade agreement, so EU trade would be expected to be substituted to some extent by enhanced trade within the Belt and Road region. This is true even for EU countries formally included in the Belt and Road initiative. This is because EU members cannot strike separate trade agreements with China, so they could not take part in a potential Belt and Road free trade agreement. The regional impact on trade of a Belt and Road free trade agreement The EU, which was previously the biggest winner from the reduction in transportation costs, now suffers slightly from the Belt and Road free trade agreement. The Asian region becomes the biggest winner, followed by non-EU European countries, since they can also benefit from the elimination of trade tariffs. The impact of the regional free trade agreement on the rest of the world is positive, but much smaller than for the Asia and non-EU Europe regions.

8. Conclusion

This essay used the Gravity Model in analysing trade flows between China and the OBOR countries. Trade and businesses along the "ways and corridors" created by the "One Belt, One Road" strategy of China and its leadership under President Xi Jinping have improved, with China as the focal point. In other words, this policy will catapult China as the world's greatest economic giant and powerhouse. But the project is far from complete because it is so large that encompasses many countries and regions. OBOR will impact world economy.

This essay also provided a detailed analysis of the trade created by the OBOR, to include the factors that influence bilateral trade flows between China and the OBOR countries. We conclude that China's economic

size, and the economic and market sizes of foreign partners, including their cultures impact trade flows between China and the Belt Road countries. Our simulations show that EU countries would be clear winners in three different scenarios illustrating how Belt and Road initiative could develop and impact EU and global trade. This is especially the case for current vision for the Belt and Road, which is cantered on the construction or improvement of transport infrastructure to reduce rail and maritime transportation costs.

A free trade agreement between the Belt and Road countries and China would have a less positive impact. This is also true for Eastern Europe and Central Asia and to a lesser extent, south-east Asia.

In contrast, if China were to embark on creation of a free trade area within the Belt and Road region, EU member states would no longer benefit, while Asia would.

Our results, even if not fully comprehensive because of the lack of data, should be very encouraging for the EU. This would be even more the case if we could include the cost of improving such transport infrastructure, because the financing should mainly come from China together with the countries within the Belt and Road, but not from the EU.

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