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© Yulia Panova¹ and Per Hilletofth²

¹Emperor Alexander I St. Petersburg State Transport University

²Jönköping University

INFRASTRUCTURE PROJECT PORTFOLIOS FOR SOURCING NEARSHORING OF MANUFACTURING TO RUSSIA

Abstract

Due to the growing labour cost in China, many organisations are reconsidering their offshoring decisions of manufacturing based on the deprived competitive advantage of cheap workforces. In light of these circumstances, Russia can be seen as an alternative venue with lower wages and improved governmental policy. In order to support the statement, this article provides comparative country analysis in terms of the impact of wage growth on the selling price of products. Additionally, the regulatory role in the attraction of the investments to the national economy is highlighted. In the focus are multiple communication infrastructure projects, such as dry ports, which are essential transport nodes for supporting industrial zones, where freight traffic is generated and terminated. For their development across the perspective, economic regions, the resilient investment portfolios are proposed. The inclusion of reactive and proactive strategies allows mitigating the risks and allocating transport infrastructure required for the provision of nearshoring decisions on locating manufacturers in Russia.

Keywords: reshoring, nearshoring, labour costs, governmental policy, project portfolios, risks.

1. Introduction

In many developed countries, emerging economies like Bangladesh, China, and India, have been considered as popular low-cost destinations for offshored and outsourced manufacturing for a long time. However, this perception is changing profoundly nowadays. Companies recognise that relocation of manufacturing to markets closer to the customers, only is single digits more expensive than in China or India, due to discovered hidden costs (Economist, 2013; Gray et al., 2013). The effects of these hidden costs have fostered roughly 350 companies in the United States (US) to reshore or nearshore manufacturing, bringing nearly 40,000 manufacturing jobs back from overseas over the past five years (Bostonglobe, 2015). Examples range from the large organisations, such as General Electric, to the Small and Medium Enterprises as ET Water Systems that refer to reshoring or nearshoring of their manufacturing activities.

Recently, US companies have started to nearshore manufacturing from China to Mexico, that have a much better manufacturing cost index. European based manufacturers also have begun to nearshore manufacturing from China to

Central and Eastern Europe (Capello et al., 2015; Schuh, 2014; Slepnirov et al., 2013). In addition, they move manufacturing from China to its neighboring countries, such as Vietnam, India, Bangladesh, and Russia (i.e., employing a China+1 strategy), where wages are several times lower than in China (Foerstl et al., 2016; Hwang et al., 2016). For instance, major retail chains like IKEA, Zara, H&M, and Decathlon, are thinking about moving manufacturing from China to Russia (Protsenko, 2016).

Nowadays, the growth of the wages in China has even motivated native Chinese manufacturers to move manufacturing to neighboring countries, such as Russia and India. An example would be the Chinese solar equipment manufacturer Xi'an Longi Silicon Materials, which recently opened a few plants in the Indian state of Andhra Pradesh (Power-technology, 2015). The government of China likewise intends to move manufacturing to Russia (Isaev, 2016). For instance, the Chinese clothing retail chain Sela, is interested in moving manufacturing to Russia. Other examples of Chinese manufacturing that probably will be moved to Russia include industries like shipbuilding, chemical, and metallurgical.

Due to the opportunities highlighted above, the regulatory officials of Russia intensively formulate favourable environment for the manufacturing relocation, especially to the territories of priority development. Acknowledging the successful overseas experience in the fusion of the foreign investments to the economy (e.g., Irish pro-business government policies in the attraction of the US investments; State, 2015), the establishment of the special economic zones (SEZ) and right tax rates is used as a foresight strategy.

Nonetheless, the attraction of the investments in the communication infrastructure of the industrial zones remains one of the most difficult tasks despite their importance for the social and economic development of the country. The long payback and presence of risks hinders the possibility of improving the transport access to SEZ, and therefore, aggravates the export orientation of businesses that potentially can be moved from China.

The purpose of this study is to justify the nearshoring manufacturing to Russia, particularly to the prosperous regions, which, as a rule, are situated in the vicinity to the seaports and main international transport corridors (Hilmola and Hämäläinen, 2016). Assuming the fact that these regions are preferable for warehousing and value-added services, this study also investigates different project portfolios for dry ports implementation. The substantiation and the choice of rational alternative can help decision-makers in the provision of the required infrastructure with lower risks and cost overruns. The specific research questions are: (1) 'Why nearshoring of manufacturing to Russia can be an alternative for manufacturing offshoring to China?' (2) 'How can Russian government create additional incentives to nearshoring trends?' These questions have been investigated through literature review, deterministic factor analysis, and systems dynamics models.

The remainder of this paper is structured as follows. To begin with, an analysis of one of the main factors for nearshoring to Russia (i.e. the labour cost) is provided in Section 2. This is done to better understand and justify the reconsideration of manufacturing offshoring to China. After that, the potential prerequisite for the manufacturing relocation is discussed in Section 3. First and foremost, investment climate is addressed, in which availability of transportation links is seen as an enabler of nearshoring from the distant EU countries. It is argued that there is a need for proactive actions from the governments and balanced strategies for transport infrastructure development. Then, investment portfolios of dry ports that allow mitigating risks of deficient multimodal infrastructure required for supporting manufacturing nearshoring is discussed in Section 4. Based on the evaluation of the given reasoning, the discussions about the preferred venues for production projects realisation have been outlined. Finally, the research is concluded in Section 5.

2. Arguments for nearshoring manufacturing to Russia

The factors behind nearshoring are usually seen in financial aspects (Ellert, 2015). First and foremost, wages are rising in emerging countries, like China (Bostonglobe, 2015). As a rule, labour cost accounts for 20 percent of a product's selling price in China, while, in the developed countries, this figure amounts to almost 50% (Harrington, 2011). If in China, labour costs for manufacturing are growing, in Russia, on the contrary, due to the collapse of the Russian Rouble (RUB) against the US Dollar (USD) in the last year, the wages have decreased. In 2014, the wages in Russia were 30% higher than in China, while in 2015, the wages were 25% lower (Figure 1).

Fig. 1. Estimated wage development in China and Russia until 2020.

Source: RFSSS, 2016; Tradecon, 2016.

In order to estimate the impact of such changes on the competitiveness of the selling price of the product, the comparative analysis of sale prices within Russia and China has been provided before and after estimated wage growth. For this reason, the statistics concerning the salaries in Russia and China were approximated by 2020, showing the wage growth by respectively of 155% and 44% (in terms of USD; Figure 1).

In the assessment of the impact of the wage growth on the selling price of the manufactured product, it was assumed that, in the context of supply chain processes, the increase of wages at the intermediate steps of the manufacturing will inevitably enhance the material cost required for the production of the final product. As the result, the selling price of goods will grow. The question is, how much? It is dependent on the specifics of manufacturing process. The supply chain can be comprised of several technological stages. As a rule, the production of certain kinds of goods usually consists of three to five phases. In the manufacture of clothing, the phases would be harness of agricultural raw materials, yarn spinning, weaving, and tailoring of the final product, i.e. four stage-processes. The production of the mobile phones or cars includes the following stages: extraction of natural resources, their processing for the generation of the primary materials, manufacturing of parts, assembly of components, and construction of the final product, i.e. five-step process.

In the given case, the four steps of the production process were regarded as an example. The main thing to note is that the material costs of the one current or considered stage are simultaneously perceived as the cost of finished product of the previous production stage (Table 1).

Table 1

The impact of the change of wages in China and Russia on the selling price.

Indicators	Phases of production							
	1		2		3		4	
	before	after	before	after	before	after	before	after
Final production stages								
Selling price	4040 (3836)	4396 (4772)	4396 (4772)	4595 (5333)	4595 (5333)	4767 (5252)	4767 (5252)	4870 (5672)
Profit	970							
Material costs	2262	2262	2262	2461 (2823)	2461 (2823)	2633 (3308)	2633 (3308)	2736 (4213)
Wages	808 (604)	1164 (1540)	1164 (1540)	1164 (1540)	1164 (1540)	1164 (1540)	1164 (1540)	1164 (1540)
Growth		+1050 (+936)						
Intermediate production stages								
Finished product	2 nd stage		3 rd stage		4 th stage			
	2262	2461 (2823)	1960 (1565)	2132 (2050)	1175 (1355)	1272 (1775)		
Profit	543 (633)	543 (633)	470 (376)	470 (376)	282 (325)	282 (325)		
Material costs	1267	1267	1099 (876)	1099 (876)	658 (759)	658 (759)		
Wages	452 (362)	651 (923)	391 (313)	563 (798)	235 (271)	338 (691)		
Growth		+199 (+561)		+172 (+485)		+103 (+420)		

Note: the idea of developing the table was taken from Petrov-Shikotihin (2003).

According to Table 1, the material costs of the 1st stage are the cost of finished goods of the 2nd stage. The summing up of all the elements of the 2nd stage of the production after 155% increase of the wages for Russia (from 362 to 923 units) and 44% for China (from 452 to 651 units) results in the growth of the cost of the finished product at a rate of 2823 and 2461 units respectively. As the consequence of the 2-staged production process, the material costs of the 1st step, and hence, the cost of finished product increases by additional 561 and 199 units for Russia and China. Consequently, the latter will amount to 5333 and 4595 units. Thus, the 155% and 44% increase of wages gives 39% and 14% growth of the selling price in the case of the two-staged supply chain. On the whole, within the all staged supply chain, the price of sale will increase for Russia and China by 48% and 21%. Thus, the inflation of selling price is 2-3 times lower than the growth of wages (Table 1).

Meanwhile, the growth of prime cost and to the larger extent selling price in Russia can be counterbalanced by the exchange rate. In particular, since the selling price is comprised of prime cost and profit, the profit of the exporter can be enlarged because of the decrease of the national currency in relation to USD. The continued decrease of RUB in relation to USD can provide the growth of the profit for manufacturers located in Russia (11% by 2020). The opposite situation is with Chinese Yuan (CNY), since the currency pair rate concerning USD increased in favour for CNY. Thus, the development of the exchange rate by 2020 regarding CNY can reduce the profit of manufacturer located in China by as much as 7.7%.

3. Governmental role in the attraction of the investments

The efforts of the governments in improving the investment climate inevitably bring positive seeds. In recent years, the ranking of the country by the Ease of Doing Business Index (EDBI), which annually is published by the World Bank, has risen by 69 positions. As a matter of fact, Russia lifted up from 120th place in 2011 to the 51st in 2015 (World Bank, 2016). If the aggressive trend continues, then in 2018, the country will have a chance to get into the top 20 economies with the best investment climate (+100 points from 2011), as prescribed by Presidential Decree on the Long-Term Government Economic Policy (Ministry of Economic Development of the Russian Federation, 2015).

The occupied positions would not be possible without governmental policy. In particular, several procedures related to the business development were simplified. The state cancelled the requirement of the payment of the authorised capital of the company before the registration. Moreover, the notification of the tax authorities on the opening of a bank account was also abolished. The procedures, concerning the transfer of property, likewise have been simplified by the abolition of the mandatory notarization, which considerably reduced the registration time. These changes allowed improving

the country's position in the categories 'Business Registration' and 'Registering Property'. In addition, Russia has moved up in the category 'Dealing with Construction Permits'.

In 2016, Russia also was regarded as the most top innovative economies, according to the rankings of Bloomberg (2016), occupying the 12th place in the ranking (two spots higher from the previous position), thus, overpassing such countries as, for example, China, Britain, Belgium, and the Netherlands. In the list, South Korea is at the top, followed by Germany, Sweden, Japan, and Switzerland, while China is ranked at 21st and India as 45th, with Brazil and South Africa not making the rankings.

Despite the economic challenges nowadays, Russia increased the number of domestic high-tech companies, providing a better position of the country in the category 'High-tech Density'. The patent activity and the number of workers with tertiary degrees have enchanted. The last pillar makes the country more attractive for the location of manufactories. The availability of labour of different skill levels, along with the proximity to the research centres, especially in the European part, can positively affect the choice of the investors, who intends to nearshoring manufacturing from China to Russia.

To compete more efficiently on the markets, governments of both countries provide better economic regulations. For example, the states create special economic zones. In China, in the areas of special economic zones, there are about 45 thousand enterprises, accounting for 18% of their total number in the country. In Russia, compared with the global arena, on which several thousand SEZ operate, the number of SEZ reached 24 with a high share of tourism and a low proportion of industrial zones (Ilyushchenko, 2011). The reason behind this trend is in that the mechanism of special economic zones was relatively new for Russia. In 2006, the tourist-recreational SEZ appeared, and in 2008 the first competition for the creation of port SEZ was held. Recently, Summa Group started to support the project of the free port (Porto Franco) in the Russian Far East (Vladivostok seaport), advocating for this idea by citing excellent examples of the fast cargo base growth in Shenzhen and Singapore (Vestiprim, 2016).

On the whole, this special economic zone in the Far East extends over 15 municipalities of the south of Primorsky Krai and covers about 30 thousand m². The area includes all the principal southern seaports of the Far East (including Vladivostok, Zarubino, and Nakhodka seaports). The economic stimuli imply free customs zone and a visa-free regime of visits. Such zones are widely popular in Luxembourg, Switzerland, and Singapore (Primamedia, 2015). Additionally, the state provides to residents free of charge of the road and engineering infrastructure, as well as preferences and privileges in the income tax: a reduced rate is applied in the first five years, e.g. no more than 5%, and over the next five years - not less than 10% (instead of ordinary income tax rate of 20%).

Meanwhile, the innovative economy and business setups are undermined by undeveloped infrastructure that poses challenges for accessing markets outside of the main cities and the hinterland of the seaports. To mitigate the issue of undeveloped transport links, worldwide, the attention is paid to the construction of terminal and warehousing infrastructure along the international transport corridors, especially on the approaches to the seaports. This idea is backed by the concept of dry ports that, in turn, is supported by state and different transport actors, including railway companies and seaport authorities.

In Russia, dry ports are tended to be developed in the regions that have a status of the territory of priority development (e.g., within the seaport of Ust-Luga, Vladivostok, and Novorossiysk). On the ground of dry ports, the communication between different modes of transport (sea, rail, road and air) is provided. Organisation of the multimodal transportation system in the territories, which are adjacent to the seaports, has to integrate into the supply chains, new manufacturing, including pharmaceuticals, e-commerce, automobile assembly plants, and other productions.

In order to accommodate the deficient infrastructure, the government of Russia employs new forms of attracting investment, such as the public and private partnering in the Russian market (i.e. public-private partnerships). This kind of transport business development allows allocation of communication between the industrial zones within the country and across the borders (Grimsey and Lewis, 2007; Primamedia, 2015).

4. Dry port project portfolios for sourcing manufacturing

In light of the current investment climate, the formation of the infrastructure within territories of priority development is deteriorated by the presence of risks. One of the most obvious uncertainties is related the country risks, arising from possible changes in the business environment due to financial and political factors.

In this regard, risk management remains one of the alternative options to reduce financial losses and provide the necessary means of communication for balanced development of the manufacturing. To mitigate risks, alternative strategies for the implementation of the dry port project in the industrial zones of the seaports have been formulated. The scenarios include reactive and preventive options to offset the negative effects of exposure to environmental factors.

For example, the reactive strategy involves ‘wait and see approach’, i.e. the absence of any action before the risk event (Kirilmaz and Erol, 2015). In the case of this plan, the differing of investment takes place due to the absence of reasons or resources to start or continue the project. Inactivity can delay efficiency gains and result in missed revenue or partly reduce the financial losses. In the case of the decrease in the cargo base, the delay of the

development of capital intensive transport projects can be reasonable for reducing the expenses on the operation of the object without means (traffic flow) for obtaining the income. Admittedly, the preventive strategy of project development can also be taken into consideration, e.g. the diversification of risks by the development of extra services apart from the basic operations with containers (e.g., grain and metals processing on the territory of dry ports).

In order to evaluate these proposals, in the study, deterministic discounting cash flows methods were combined with the Monte Carlo method, which is recognized as one of the promising ‘tools’ for the analysis of the system with the allowance of uncertainties and risks (Ambrasaite et al., 2011; Grimsey and Lewis, 2007; Lättilä, 2012).

The primary attention was focused on the comparative characterization of options based on the main criteria of economic efficiency of the project. That is the discounted payback period (DPP) and net present value (NPV). Cash flow analysis of dry port development scenarios, which was carried out using the Monte Carlo method, showed that the delay of investment, for example, from the 14th and 18th year instead of the 8th and 10th, respectively, in case of the decrease of container traffic, can improve the performance criteria of the project, compared to the baseline scenario (without risk mitigation strategies). In particular, due to this reactive alternative, the project accumulated profits increase on average by 52.8% (from 1.173 billion RUB to 1.792 billion RUB) with a standard deviation of 341.7 million RUB (Figure 2).

Fig. 2. Sensitivity analysis of the reactive alternative No. 1 of dry port development.

It should be noted that the selected duration for the delay of investments is the most rational, as was found by the evaluation of the simulation results. The introduction of the dry port technical states in earlier or later years of its phased development would provide a lower value of the accumulated profits of the project (1.510-1.782 billion RUB) and a longer period of return on investment.

In the rational scenario of the selected years for the phase's implementation, the discounted payback period was reduced to 11 years and 9 months from 15 years 5 months (for the scenario without strategies to reduce risks). Thus, the approach based on the reactive option allowed reducing the total risk of loss of income for the project and avoiding longer payback periods. In addition, this option of delaying investments during the years of traffic decrease helped to decline the value of risk. The coefficient of variation (CV) of obtaining the income and covering the investments became 19.07% instead of 25.06%, which was reflected in the baseline scenario with all risks.

The next proposed alternative strategy of dry port project development, which is proactive one, implies the introduction of additional services (grain and scrap ferrous metals processing). It brought a more efficient reduction of risks. According to the analysis of the simulated results, the investments will pay off within 13 years 6 months and provide a cumulative profit of 1.743 Bl RUB, with the CV of 21.67%.

If to combine the current option with reactive alternative 1, the results can be more optimistic. For this purpose, the combined alternative was evaluated. Proactive option 2 was amended by putting off the investments in Phase 3 and Phase 4 from 8th year and 10th year, respectively to 13th and 15th years due to the reduction of container traffic during 6–8 years. These changes provided the following outcomes. The cumulative profit (CP) from the combined alternative of dry port project realisation will be 2.202 Bl RUB with the standard deviation of 407.2 Ml RUB, which is comparably higher than in the scenario without risk mitigation strategies, with the CP of 1.173 billion RUB. The DPP will equal to 10 years 8 months. The CV would be 18.48%, meaning the reduction of risks, if compared to the base scenario with all unmitigated risks, in which the CV equalled 25.06%.

On the whole, the results from three scenarios of dry port project development show that the most preferred option for reducing the risk impact on the retained earnings and the payback period can be a combination of two tactics: the delay of investments in the case of redistribution of container traffic between seaports (reactive strategy) that can be complemented by a diversification of risks by the development of the additional services at the dry port.

5. Conclusions

In the light of the current economic situation, the development of manufacturing in Russia may be a feasible alternative compared to the widely used option of offshoring/outsourcing manufacturing from developed countries to China. The analysis showed that the arguments for such tendencies are related to financial aspects. China will no longer be the country with the cheapest workforce. This issue is also aggravated by the stabilisation of the CNY compared to USD,

which reduce the chances of obtaining additional profit by exporters who locate manufacturing in China. On the contrary, in Russia, the wages in the last year have decreased 25% compared to China due to the collapse of the RUB against the USD.

Based on the wage development approximations it was found that the wages growth contributes to the increase of the selling price, since labour cost, as well as material cost, are main components of the prime cost. By decreasing the prime cost, companies increase profit margins that are included in the sale price. Alternatively, companies may sacrifice the additional profit margin (if available) in order to reduce the selling price. Assuming that the price of sale can increase by as much as 39% by 2020 in Russia and by 14% in China, the profit change can counterbalance the growth of selling price.

In the case of Russia, the additional profit of the exporter, which can be generated by the favourable exchange rate of RUB in regard to USD, can be sacrificed for the reduction of the selling price. It is expected that, if the manufacturer is located in Russia, the profit on the ground of currency pair rate can increase by 11%. The opposite situation is in the case for CNY, since the development of the exchange rate by 2020 can reduce the profit of the manufacturer situated in China by as much as 7.7%.

The possibility of obtaining the profit by the exporter located in Russia, as well as low wages and the development of the transportation links from the industrial zones to the hinterland can support the interest in nearshoring manufacturing to Russia. So far, the government has enabled the favourable tax rates in the special economic areas and the territories of priority developments that are located in the vicinity of the main seaports. Particular attention is paid to the Russia's eastern regions, where the national resources and Chinese technologies, which somehow substitute the dependence on Western technologies, are used to progress the transport and manufacturing infrastructure implementation.

One of the forefront investment projects within industrial clusters of the seaports concerns the formation of the multimodal nodes based on the idea of the dry port that allow the interface of different transport modes, sourcing the manufacturing. For their construction in the shortage of the finances, the public-private partnerships are utilised. Along with the innovative forms of cooperation in business, several investment portfolios have been proposed, assuming that even the crisis can be considered as an appropriate time for development. That is the reactive and proactive strategies (e.g., the delay of investments in case of the traffic flow decrease and diversification of risks by the provision of the additional services within the dry port). The combination of both alternatives in one portfolio can reduce the impact of risk compared to the scenarios without risk mitigation strategies by 36%, and improve the financial indicators of the project, such as net present value and discounted payback period. Once the required infrastructure would be set in place in the industrial zones and the

pressure from sanctions is relieved, Russia could unlock its potential for the foreign direct investments, flowing not only from China, but from western countries as well.

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