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FROM CENTRALITY TO INTERMEDIACY IN THE GLOBAL TRANSPORT NETWORK? UKRAINE'S TRIALS AND TRIBULATIONS AS A POTENTIAL TRANSIT COUNTRY

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Abstract

Ukraine currently is in a very complex economic and political situation, which in itself represents a pivotal point for its further recovery and evolution. Nevertheless, the rise of economic centres in Eastern and Central Europe creates opportunities for Ukraine to develop short sea shipping services (via the Black Sea) and water and land-based hub-feeder networks to and from these areas. This paper provides an academic study of the potential of Ukraine in taking up a role in emerging distribution systems in East and Central Europe facilitating the cargo transportation from regions such as Central Asia, Caucasus and even more distant overseas areas. Based on the concepts of intermediacy and centrality as introduced by Fleming and Hayuth (1994) the role of Ukraine in the global and regional transport networks will be analysed in order to assess to what extent particular regions in Ukraine can serve as important gateways to Europe. An extensive review and synthesis of the published studies during the last 20 years on Ukraine's transit flows and transit function will be presented. The obtained results will be contraposed to the results obtained from about 20 interviews conducted with transport business representatives in Ukraine and abroad. Based on the outcome of bottlenecks and deficiencies in Ukraine's transport system, the optimal road map for Ukraine's integration into the European transport network will be defined.

Keywords: port, centrality, intermediacy, systematic review, research synthesis.

Introduction

Geo-political tensions have pushed Ukraine into a deep crisis. Real GDP contracted by 8.2% in 2014 with a continued drop in 2015. The conflict in the East has disrupted economic activity, which in its turn made the collection of taxes difficult. The exports have declined and the overall consumer and investor confidence fell significantly. At the same time a weak national revenue performance, rising expenditure to tackle the crisis along with a growing Naftogaz (Oil and gas state Company) deficit make fiscal adjustments more challenging. The Ukrainian

government has allowed a free floating exchange rate resulting in a 50% devaluation of the currency. Import gas prices are high and energy efficiency of the national industries is poor. The balance of payments pressure remains high due to large external debt refinancing needs, low FDI and limited access to external financing. All of these developments combined with deteriorating relations with Russia, a weak banking sector, low foreign exchange reserves, large debt repayments needs (for the next 2 years) together with constrained domestic consumption pose risks and affect the prospects for recovery.

However, there are also positive factors for the development of Ukraine: (i) the strong external support for Ukraine ($27bn in the next two years), (ii) authorities are motivated to reform, (iii) trade relations with EU have improved and (iv) the economy has a high long-term potential. To overcome the current recession in Ukraine, international and local experts have made several policy suggestions: (i) stick to the floating exchange rate, (ii) stabilize public finances, (iii) improve the country's competitiveness and (iv) develop new export markets. Also, the "ease of doing business" with Ukraine has to improve to boost investments and the energy sector has to be restructured to become less dependent on Russia and certainly to get more energy efficient.

Logistics is a key area to improve the country's competitiveness and to improve the ease of doing business. The transport system of Ukraine is the focus of this paper. We identify the factors impeding Ukraine from fully exploiting its potential as a transit country between different systems of circulation. The geographical centre of Europe is located in Ukraine, more precisely in a city named Rakhiv located in the Western part of Ukraine (Zakarpattia Oblast). Still, the country until now has not been able to play a pivotal role in European cargo flows. Figure 1 demonstrates the ongoing decrease of transit cargoes through Ukraine.

At the same time, there are rather promising signals related to the Ukrainian container market: the transhipment shares in the ports appears to be growing (for reallocation purposes to/from Novorossiysk, Poti, Constanta), but more importantly the transit share of container traffic shows growth. There is no reliable data available on the precise volumes of transit containers for all countries served by Ukrainian ports, but all in all: (i) the major container markets served are Uzbekistan, Moldova and Russia, (ii) the minor container markets are Belarus, Turkmenistan, Azerbaijan, Lithuania and Kyrgyzstan. The current container transit flows are to a greater extent dominated by export transit (approx. 2/3 of the total transit containers) rather than import transit (approx. 1/3 of total transit containers). Moreover, the share of containers transported by rail to/from ports is much lower than the share by road (roughly 20% vs. 80% respectively). So for example, containers originating from Uzbekistan with a final destination overseas, arrive at Ukrainian ports by road and not by rail as it would be expected (approximate distance by road 3,400 km).

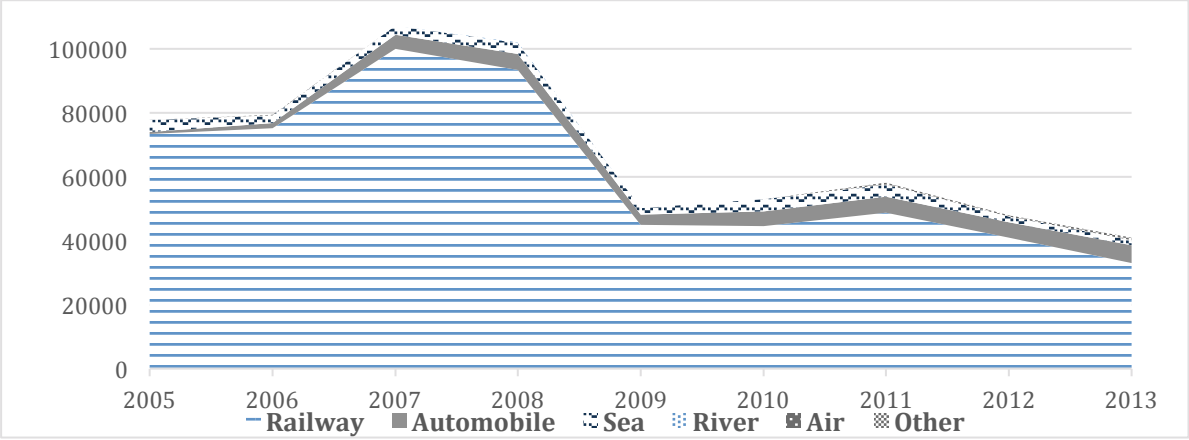

Figure 1. Transit cargo flows via Ukraine

Source: own compilation based on Ukrstat data.

This paper focuses on the function of the Ukrainian transport network in facilitating trade. More in particular, we examine to what extent Ukraine's transport network is characterized by intermediacy and or centrality, both now and in the future.

Table 1. Operationalization of the research scope

Concept	Dimensions	Indicators	Calculations of scores
Centrality	Ukraine being as a point of origin and destination of traffic	# of published studies mentioning the centrality function of Ukraine	calculation
		Origin - destination matrix of the cargo flows in Ukraine	calculation of domestic cargoes versus transit cargoes
Intermediacy	Ukraine being a point of transit between different systems of circulation	# of published studies mentioning the intermediacy function of Ukraine	calculation
		factors identified in literature affecting the intermediacy function of Ukraine	calculation
		factors identified from interviews affecting the intermediacy function of Ukraine	calculation and coding
Cargo flows within Europe	Heterogeneous	Origin - destination matrix of the cargo flows in EU	Amount of each cargo type to/from EU originating or dedicated to MUBRCAC
		Design of supply chains connecting EU and neighbouring regions (MUBRCAC)	Transit countries used for the cargoes of MUBRCAC.

Note: MUBRCAC = new Eastern Europe, Russia, Central Asia and Caucasus.

Source: author.

The hypothesis is that Ukraine has the potential of becoming an intermediate area for emerging distribution systems in East and Central Europe facilitating the cargo transportation from regions such as Central Asia and the Caucasus. Table 1 provides an overview of how the research scope will be further operationalized in order to address the formulated hypothesis. The research design will be discussed in detail further in the paper.

1. Theoretical concepts of intermediacy and centrality

Two main concepts from economic geography will be used in this paper, namely intermediacy and centrality as introduced by Fleming and Hayuth (1994). These concepts have been widely applied to economic and transport geography. Centrality focuses on the port/country/region (its vicinity) being a point of origin and destination of traffic. At the same time intermediacy focuses on the port/country/region being a point of transit between different systems of circulation. Figure 2 provides a graphical presentation of the two notions. Notteboom (2012) analysed to what extent and for which trade lanes the Cape route could serve as a competitive alternative to the Suez route based on the concepts of centrality and intermediacy.

Ulmann (1954) and Fleming and Hayuth, (1994) note that centrality and intermediacy are place and situation dependent. Fleming and Hayuth (1994) developed a comprehensive framework on general spatial qualities of a "good location" with respect to present and potential trade and transport systems.

More recent applications and developments of the concepts of centrality and intermediacy include the work of Tsiotas and Polyzos (2013) introducing a new centrality measure applied to the transportation network in Greece. The measure, determined as mobility centrality (Cm) applied to the Greek interregional road network, enables to quantify the centrality by illustrating the flow tendencies. The outcome of the research stated that the most central locations in Greece are Athens, Thessaloniki and Achaea (all being ports with the exception of the last one).

Li et al. (2014) take a more global perspective and quantitatively measure the centrality in the global shipping network (GSN). The paper breaks down global shipping into 25 geograph-

ical regions, and presents an analysis of each shipping area's position in the GSN through network centrality indicators. The results reveal that, to a large extent, Europe is always in the center of the GSN from 2001 to 2012, but its central position is declining. The ranked top three shipping areas are relatively stable, among them: Europe, Mediterranean and Far East. Peculiar that the ranking of the last five shipping areas (i.e. North Africa, St Lawrence Seaway, Black Sea, North Atlantic and Baltic Ocean) is quite stable.

Brooks et al. (2010) addresses the strategic cooperation in Canadian ports applying among others the concepts of intermediacy and centrality. They concluded that "[…] good intermediacy and poor centrality – applies to ports in Atlantic Canada, especially to those ports serving interior continental markets with competitive hinterlands." Brooks et al. (2010) made a general observation with regard to ports' relative location conditions: "if ports lack both intermediacy and centrality, they will struggle to serve shippers' needs."

We testify that at present Ukrainian ports and the Ukrainian transport network is mainly characterized by the centrality phenomenon rather than by intermediacy. This is clearly demonstrated by the cargo flows within the country which serve mainly the local economy (export/import oriented) and the fact that transit flows are continuously declining (see figure 1). Furthermore, as Grushevska and Notteboom (2014) point out, Ukrainian ports represent a secondary multi-port gateway region – somewhat remote from the main shipping route and heavily dependent on the East Mediterranean ports where the vast share of the cargo flows (mainly containers) is transhipped. In this sense, ports of Ukraine represent an opposite case from Canadian ports. In order to spur Ukrainian cargo flows and trade the country's strong centrality has to be maintained, and its weakness, i.e. the low intermediacy, has to be alleviated.

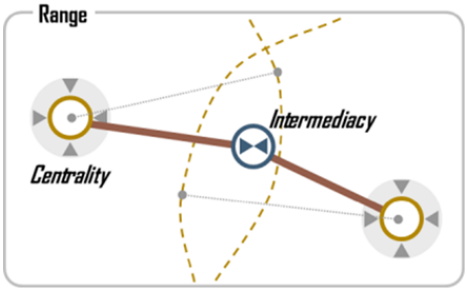

Figure 2. The illustration of the concepts centrality and intermediacy

Source: 14. Rodrigue, J.-P., Comtois, C., & Slack, B. (2013)

These concepts from economy geography (centrality and intermediacy) are suitable for our research in view of analysing (i) the historical and actual intermediacy/centrality functions of Ukraine, and (ii) the potential future functions based on new geopolitical, economic, technological and other prospects. In other words, we apply the concepts of intermediacy and centrality to analyse the current and future role of Ukraine in the global and regional transport networks.

2. Methodology

The unit of analysis of the current research are the transport networks of the EU and Ukraine. For the purpose of this research three data collection techniques were used:

- interviews conducted in 2014 with transport business representatives in Ukraine,
- a follow-up survey based on the results of the interviews,
- a systematic review and synthesis of published studies (time span 2001-2014).

2.1 Interviews

Interviews were carried out in the summer of 2014 followed by a structured survey in the fall of 2014. Semi-structured interviews were the most attractive method for collecting the necessary qualitative data, though this method is very time consuming (Bryman and Bell, 2011). The semi-structured interview represents an interview were the interviewer has a list of questions on specific topics to be covered, also referred to as interview guide (Bryman and Bell, 2011). At the same time, the interviewee has a great latitude in how to answer. The questions from the interview guide may not follow in the noted order, but en masse all questions will be asked to every interviewee.

For the scope of our research 18 representatives from the transport industry were contacted in Ukraine. The structure and types of selected and contacted respondents are displayed in table 2. It should be noted that the only stakeholder/business area, which was missing a respondent, was the Ukrainian railway company. It was very difficult to get representatives on board of the survey. Nevertheless one 3PL company, which also functions as the only train operator in Ukraine (Viking train), was included in our interview and later in the survey. The institutional stakeholder was also included in the interviews and survey which was represented by the Sea Ports Administration of Ukraine.

Table 2. Profile of interviewees

Type of business	Total number	Positions		
		Senior manager	Middle ranked manager	other
Shipping and ship management companies	4	2	2	
Forwarding and 3PL	5	3		2
Terminal operations	4	3	1	
Sea ports administration of Ukraine	2	1		1
Consultancy	2	1	1	
Inland navigation	1	1		
Total	**18**	**11**	**4**	**3**

Source: Authors compile.

The interviews covered a range of issues, associated with (i) the transit function of Ukraine for the EU economy as well for East Europe and Central Asia, and (ii) the hinterland connections of Ukraine.

2.2 Survey

As a logical extension and continuation of the interviews, a survey was designed in order to quantitatively assess the detected factors that hinder the intermediacy of Ukraine. Based on the interviews results, 26 factors were identified as disruptive factors or obstacles to the intermediacy function of Ukraine. The survey method allowed contacting all the respondents from previous interviews in order to rank the 26 factors using a Likert scale from 1 to 5 based on two indexes: (1) degree to which the factor negatively affects the intermediacy role of Ukraine and (2) the degree of importance. The more points a factor received the more influential and important it is.

2.3 Systematic review and synthesis of published studies using CASP

Systematic review is a research method, which defines specific procedures that require the reviewer to report each step in a straightforward and accurate manner. A systematic review co-

vers five steps (Denyer and Tranfield, 2009). The first procedure is to formulate review questions which address the specific questions of initial interest, namely, the things you want to know and synthesize from the review. In the following step, an exhaustive literature investigation of available studies is conducted to ensure that the review results consider all the available information and are based on first-class contributions. Then, the third step is to select and classify the studies by using a set of explicit criteria, which primarily check whether a study is relevant to the review questions and whether its results are legitimate and reliable. Widely used general quality checklists, such as the Critical Appraisal Skills program for systematic reviews (CASP checklist) is applied in this phase. After this process, the selected studies are analysed and synthesized. The last step is the most crucial of the whole process of systematic review. Rousseau et al. (2008) argued that the efficacy of any use of evidence depends on the availability of carefully conducted systematic research syntheses. The outcome of the systematic review is a well-structured list of contributions which are valuated according to their consistency, omissions, limits and untested assumptions in the existing literature. A well implemented systematic review is based on the application of the above described five steps in a strict and transparent manner.

3. Research design

In this paper we developed a cross-sectional research design. This type of design allows us to collect, at a certain moment in time, an amount of data coming from the different variables. The purpose is to detect patterns in the collected data. In our case, the variables are the factors hampering Ukraine's intermediacy with an estimation of each factor's importance and power of influence (figure 3). As mentioned earlier, the 18 interviews of the first phase of the research helped to identify 26 significant factors affecting Ukraine's intermediacy. These factors were further used in the survey and systematic review phases. Table 3 presents the identified bottlenecks.

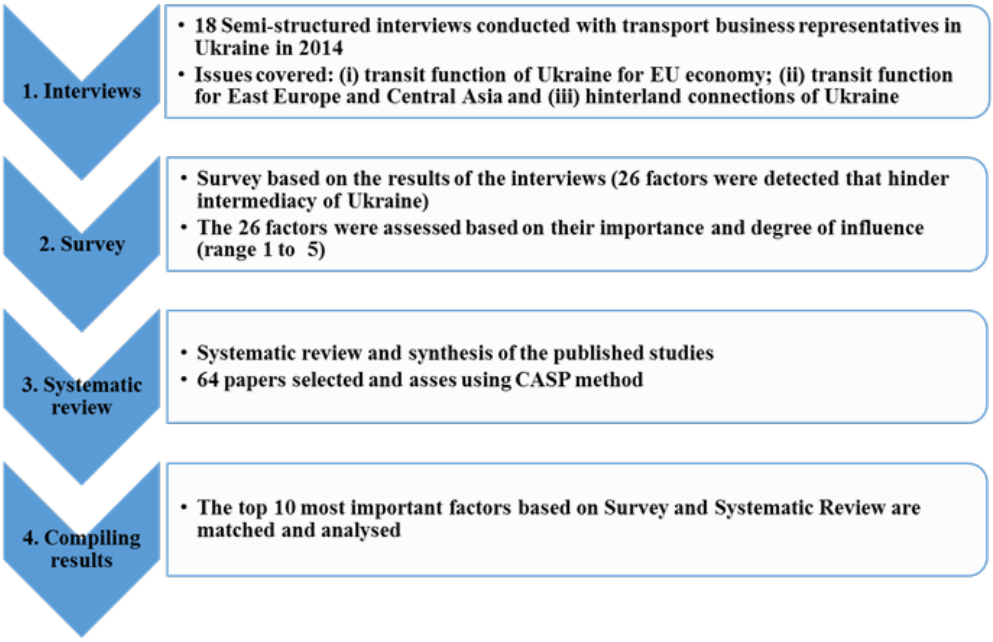

Figure 3. Steps in the research design

Source: author.

During the survey process, the respondents who participated interviews phase were asked to evaluate the negative factors hindering intermediary of Ukraine based on two criteria: (1) their importance (on a scale of five, from less significant to extremely significant) and (2) degree of negative influence (on a scale of five, from poor influence to great influence).

Table 3. Bottlenecks detected from interviews

Area	#	Negative factors for Ukraine's intermediacy
General	1	bureaucracy procedures/ legal formalities
	2	administrative barriers and delays
	3	lengthy regulatory/administrative procedures
	4	customs efficiency and delays
	5	politics/government being an obstacle in the development of transport system
	6	corruption (generated by the law executives)
	7	legislative base and implementation practice for investments (rail, ports, inland waterways)
Ports	8	poor port legislation / policy
	9	insufficient/old port terminal infrastructure
	10	shortage of railway and road approaches to ports and dry ports
	11	lack of dry ports
	12	high port costs (dues)
	13	high port THC
Railway	14	poor railway legislation/ policy
	15	shortage of rail infrastructure (roads + rolling stock + terminals)
	16	inefficient and outdated operational work style of state railway company UZ
	17	high railway costs in Ukraine
	18	high railway costs in Georgia, Azerbaijan (as a factor of the whole supply chain of TRACECA corridor)
	19	weak security of railway transport
Inland navigation	20	inadequate inland navigation legislation and policy
	21	deficient inland waterways infrastructure
	22	high inland waterways costs (ports, locks and bridges)
	23	obligatory pilotage on Danube River
Other	24	insufficient ferry services quality and their high costs on Caspian Sea (factor for TRACECA corridor)
	25	Lack of logistic zones, warehouses in Ukraine
	26	inferior existing road infrastructure

Source: author.

The most substantial negative factors impeding the intermediacy function of Ukraine are: (i) corruption, (ii) customs, (iii) bureaucracy procedures/legal formalities, (iv) administrative barriers and delays, (v) politics, (vi) port costs, (vii) railway infrastructure, (viii) railway operational work style, (ix) legislative base and implementation practice for investments and (x) lengthy regulatory/administrative procedures. All these factors are located in the right upper corner of the matrix (figure 4). The majority of the mentioned factors are of a more general nature with no specific regard to a certain type of transport (factors i-v and ix-x). One factor was specifically seaport-related (vi) and the two remaining factors railway-related (vii-viii).

The systematic review results are presented in figure 5. In total 64 papers, reports and other were selected: 12 reports (working papers, consultancy reports and other practitioner material), 37 papers (Master thesis, papers and articles) and 15 conference materials. The time span of the contributions was between years 2001-2014. Such an extensive time span can be explained by the fact that (i) focusing on a shorter period would considerably reduce the contributions; (ii) no incremental changes have taken place during last 13 years in the fields of: transportation legislation, trade patterns and infrastructural projects; (iii) there are hardly any valuable papers before year of 2001). That led to an exhaustive list of contributions describing in one way or another the transport industry in Ukraine. On the horizontal axis of the figure 5 we find the percentages of papers (out of total 64) in which a certain factor was mentioned as a bottleneck.

For the current CASP analysis we considered and simultaneously covered the whole range of degrees of factors' mentioning (from brief to more in depth analysis of listed factors in selected papers) (see appendix).

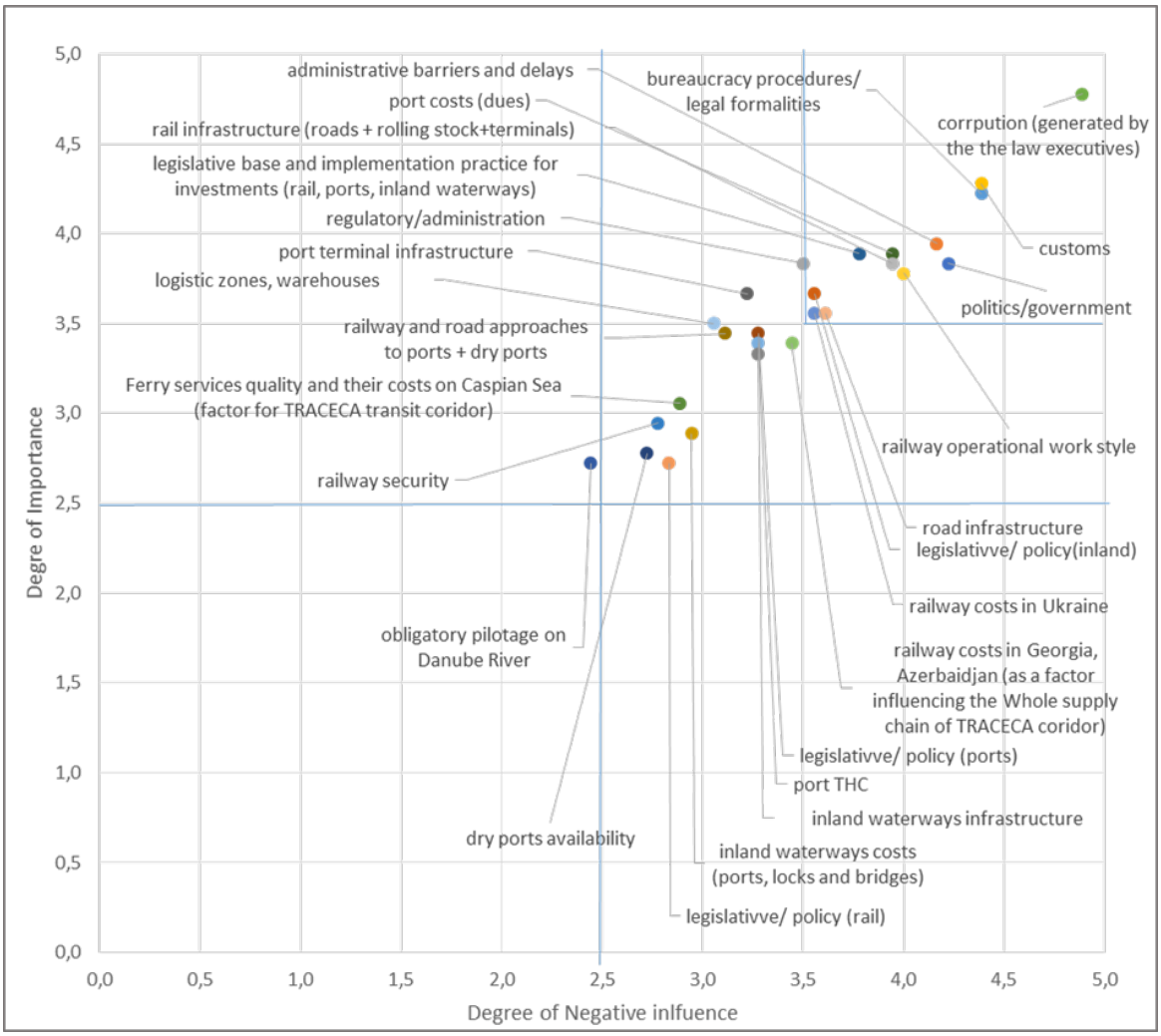

Figure 4. Survey results detection of negative factors for Ukraine's intermediacy

Source: author.

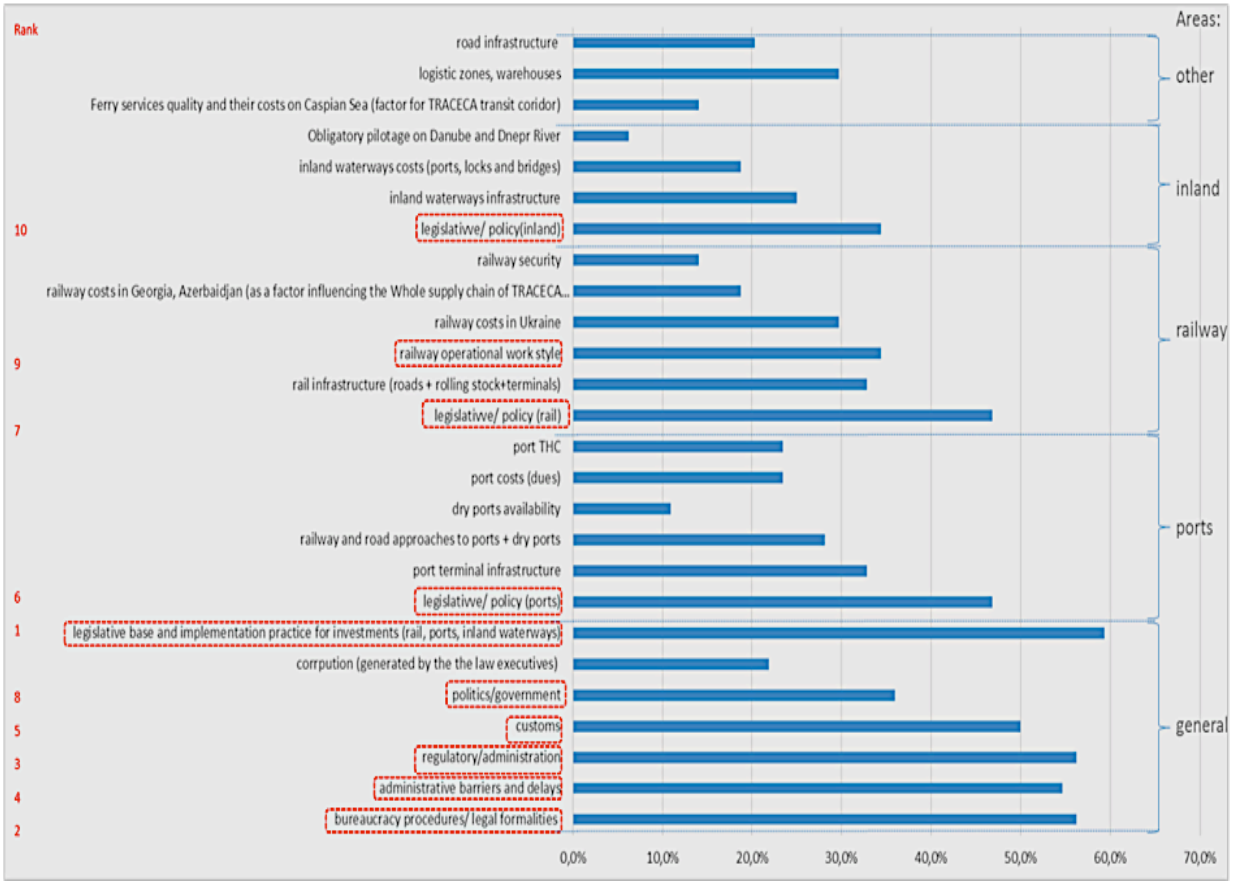

Figure 5. Systematic review results

Source: author.

A comparison of the two approaches gives a good perspective on which factors really matter for the intermediacy of the Ukrainian transport network (figure 6). The factors that received the highest scores in both approaches include: (i) legislative base and implementation practice for investments; (ii) bureaucracy procedures/legal formalities; (iii) lengthy regulatory/administrative procedures; (iv) administrative barriers and delays; (v) customs; (vi) politics/government; (vii) railway operational work style. However, there are some differences among the top 10 rankings of factors between both methods as we will discuss in more detail in the next section.

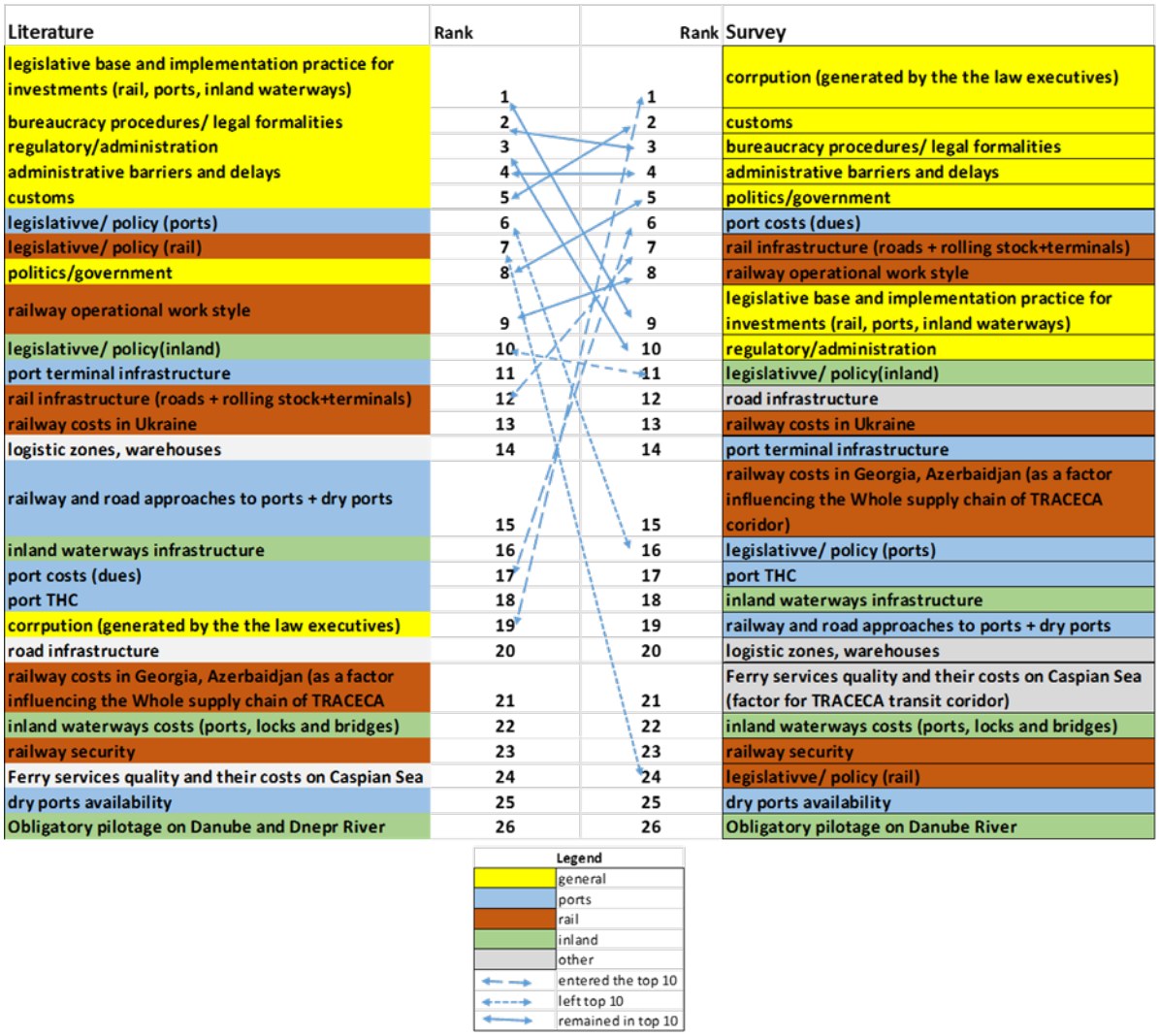

Figure 6. Comparison of the results of both approaches: systematic review and survey

Source: author.

4. Analysis of the survey and results synthesis

There are seven common bottlenecks in the top 10 list as defined by both methods. Six out of the seven common barriers are of a general nature, with no specific relation to any transport mode. Some of these bottlenecks have been also identified by the World Bank global report on "ease of trading across the borders" in which Ukraine is ranked 154rd out of 189 economies in total. The World Bank indicator takes into consideration (i) the number of documents required to export and import; (ii) the time required to export and import; and (iii) the cost required to export and import (per container). This underlines again, how crucial the detected barriers are for the transport system of Ukraine namely: legislative base and implementation practice for investments; bureaucracy procedures/legal formalities; regulatory/administration; administrative barriers and delays; customs inefficiencies and delays; and political/ governmental barriers. Based on the two methods used there was one common barrier that relates to rail, i.e. inefficient railway operational work style. The Ukrainian rail system is characterised by a vertically integrated state-owned company that enjoys the benefits of a monopoly. That explains the inefficient and non-client oriented working style of railway company. The remaining three bottlenecks (from the top 10 list) were different depending on which method was used.

4.1 Survey based differences

The factors that are of extreme and high importance were understated in existing literature. This was specifically the case for the factors corruption, high port costs and dues, poor railway infrastructure (roads, rolling stock and terminals). There might be some reasons to explain the gap between the survey results and the systematic review results on these matters:

(i) Corruption (exerted by the law executives) was stated to be of extreme importance with a great degree of influence. In the survey results, this factor was ranked as the number one obstacle in the list of bottlenecks for the Ukrainian transport system. However, literature ranked this bottleneck only at the 19th position. This can be explained by the fact that the issue of corruption was mainly kept aside and was not really stated either considered as a real problem for the transport system of Ukraine. On the contrary, the transport practitioners systematically facing this obstacle see it as of great influence and importance for the transport system functioning. The Transparency International rating estimates the countries/territories based on how corrupt a country's public sector is perceived to be. It is a composite index, drawing on corruption-related data from expert and business surveys carried out by a variety of independent and reputable institutions. Scores range from 0 (highly corrupt) to 100 (very clean). In 2014 Ukraine was ranked on the 142nd place among 175 countries, with a Corruption Perception Index of 25. It has to be noted that this is the lowest and thus worst index of all the countries in the Black Sea region (Russia being on rank 136 with a score of 27, see appendix 5 for more details).

(ii) High port costs and dues were rated as relatively important and were located on the 6th position by the business representatives, whereas the literature survey placed this factor at the 17th position. This discrepancy can be explained by the fact that the costs and dues in Ukrainian ports are significantly higher than in neighboring Black Sea ports (Constanta, Varna, Poti, etc..) or Mediterranean ports (Istanbul and others). The port costs and dues along with corruption escalate the cost of the whole supply chain via Ukrainian sea hubs and gateways. These two matters diminish the competitiveness of Ukrainian supply chains at the national and international level, which in its turn negatively affect the business of companies active in the logistics and transport field.

(iii) Poor railway infrastructure (roads, rolling stock and terminals) was evaluated as quite important by the business representatives (seventh position in the ranking). The literature synthesis ranked this factor as number 12. Those who make consistently use of railway infrastructure can properly evaluate its actual condition. Moreover, the state railway company is not very open about the details on its infrastructure and operations, so very few sources describe this issue.

4.2 Differences at the level of the systematic review

Based on systematic review results, the remaining three factors out of the top 10 bottlenecks were the legislations /policies of: (i) sea ports, (ii) railways and (iii) inland navigation. These factors were located on the 6th, 7th and 10th position respectively.

(i) Legislation/policy of seaports was considered as a significant bottleneck based on the literature survey. Based on the survey it was ranked only on the 16th position. This can be explained by the fact that the time span considered for the systematic review is significantly large (2001-2014) and the situation concerning the condition of seaport policy improved significantly in the last few years. Namely in 2012 the Ukrainian government has adopted a new legislation (Law on Seaports) that allows privatization of seaport infrastructure and gives opportunities for new investments in Ukrainian ports. Port authorities now control only the navigation in the port's water area and few of the operational/stevedoring activities (about 25% of the total handled cargoes). The ports represent a form of public-private partnership bringing together companies of small and medium-sized business. Until 2012, the seaports in Ukraine were directly subordinated to the Ministry of Infrastructure of Ukraine. There was a very solid relation of co-

ordination and control of all the port operational activities between the ports and the Ministry that significantly inhibited investments in and the efficiency of ports.

(ii) Legislation/policy of railways was ranked as number seven albeit that the survey ranked this factor at the end of the list as number 24. As it was mentioned before, the transport representatives face the railways in their daily operational circumstances, which gives an explanation to the high scores of the railway related bottlenecks (railway infrastructure #7 and railway operational work style #8). While rail reform has not yet been implemented as initially planned, significant steps towards a change in railway legislation have already been taken. The reform program initiated by Ukrainian government several years ago (currently still at the initial stage) aims at (i) improving the management of Ukrainian Railways (UZ) and the services provided in the railway transportation sector, (ii) increasing the efficiency of railway transportation, and (iii) developing a competitive market in railway transportation in Ukraine by 2019. The reform program envisaged there stages: (1) the period 2012-2013 aimed at the creation of JSC Ukrainian Rail Ways; (2) the period 2013-2015 aimed at the creation of the subsidiaries and structuring of them according to the activity type; (3) the period 2016-2019 focuses on the elimination of cross subsidization of passenger transportation by freight transportation and the creation of an independent passenger railway company. The current changes in the UZ management generate higher expectations for railway reform than ever before.

(iii) Legislation/policy of inland navigation received a very slight difference in the ranking. It is ranked tenth based on the literature survey and eleventh based on the survey. But due to the fact that inland navigation is currently poorly used for cargo transportation in general (about 1% from total cargo traffic) few business representatives see this as a real obstacle for the transport system of Ukraine.

Conclusions

We analyzed the potential for Ukraine to become not only a central region but also an intermediate location for the cargo flows to/from Europe and Central Asia. We used two methods to depict the bottlenecks of the transport system of Ukraine impeding it to become an intermediate location. This approach resulted in a list of 26 factors, which were ranked with some differences depending on the method used. The majority of factors that received high rankings are of a more general nature with no special relation to a certain type of transport. Crucial bottlenecks of this kind explicitly represent the elements of the road map for Ukraine's integration into the European transport network: legislative base and implementation practice for investments; bureaucracy procedures/legal formalities; lengthy regulatory/administrative procedures; administrative barriers and delays; customs inefficiencies and delays; and political/governmental barriers. At the same time, three railway-related bottlenecks were detected as very important namely: railway operational work style, poor railway infrastructure and inefficient railway legislation. The port-related bottlenecks included (i) high port dues and costs and (ii) seaport legislation. One inland shipping related bottleneck was ranked in the top 10 list, i.e. the legislation on inland waterways.

The presented study shows some limitations. The interviews and the survey were carried out at a certain point in time. To obtain more rigid results, sequential observations would be more suitable. It might be useful to apply a longitudinal research design (several observations in time) instead of a cross-sectional research design (one observation in time). Moreover, while Ukraine is in a political and economic crisis the survey results can differ from the results that might be obtained in a non-crisis situation. Lastly additional stakeholders could have been included in the interviews and survey, namely foreign business representatives doing business in Ukraine.

By this research we support the findings of Ulmann (1954) and Fleming and Hayuth, (1994) that stated that intermediacy and centrality and time and situation dependent. We investigated the situation by contacting the transport industry stakeholders in order to identify the main action areas in order to spur the intermediacy of Ukrainian transport system. The following potential research avenue would be to estimate quantitatively the intermediacy and centrality features of the Ukrainian transport system such as LSCI, PLI indexes of UNCTAD and centrality and intermediacy measurres of the transport network analysis. Secondly, there is room for a more extensive analysis of the current and potential markets to be served by the transport system of Ukraine. Another possible future research avenue relates to the effect of geopolitics (e.g. the future political relation with neighbor Russia) on the transit potential and intermediacy function of Ukraine

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OD "CENTRALITY" DO "INTERMEDIACY" W GLOBALNEJ SIECI TRANSPORTOWEJ? UKRAINA JAKO POTENCJALNY KRAJ TRANZYTOWY

Streszczenie

Ukraina jest obecnie w bardzo skomplikowanej sytuacji gospodarczej i politycznej, która może być punktem zwrotnym w jej dalszej odbudowie i ewolucji. Wzrost ośrodków gospodarczych w Europie Środkowej i Wschodniej stwarza dla Ukrainy szanse rozwoju usług żeglugi bliskiego zasięgu (przez Morze Czarne) oraz śródlądowych i lądowych hub-feederowych sieci do i z tych obszarów. W artykule przeprowadzono badanie potencjalnej roli Ukrainy, w powstających systemach dystrybucyjnych w Europie Wschodniej i Środkowej, w ułatwianiu transportu ładunków z takich regionów jak Azja Środkowa, Kaukaz i jeszcze bardziej odległych obszarów zamorskich. Na podstawie koncepcji "pośrednictwa" i "centralności", wprowadzonych do literatury przez Fleminga i Hayuth (1994), zostanie przeanalizowana rola Ukrainy w globalnych i regionalnych sieciach transportowych w celu oceny, w jakim stopniu poszczególne regiony Ukrainy mogą stać się ważnymi bramami do Europy. Będzie zaprezentowany obszerny przegląd badań ukraińskich przepływów tranzytowych i funkcji tranzytowej opublikowanych w ciągu ostatnich 20 lat. Otrzymane wyniki zostaną porównane do wyników uzyskanych w rezultacie przeprowadzenia około 20 wywiadów z przedstawicielami biznesu transportowego na Ukrainie i za granicą. Opierając się na wynikach analizy wąskich gardeł i słabości systemu transportowego Ukrainy, zostanie opracowany optymalny plan działania na rzecz integracji Ukrainy z europejską siecią transportową.

Słowa kluczowe: port, centralność, pośrednictwo, przegląd systematyczny, synteza badań

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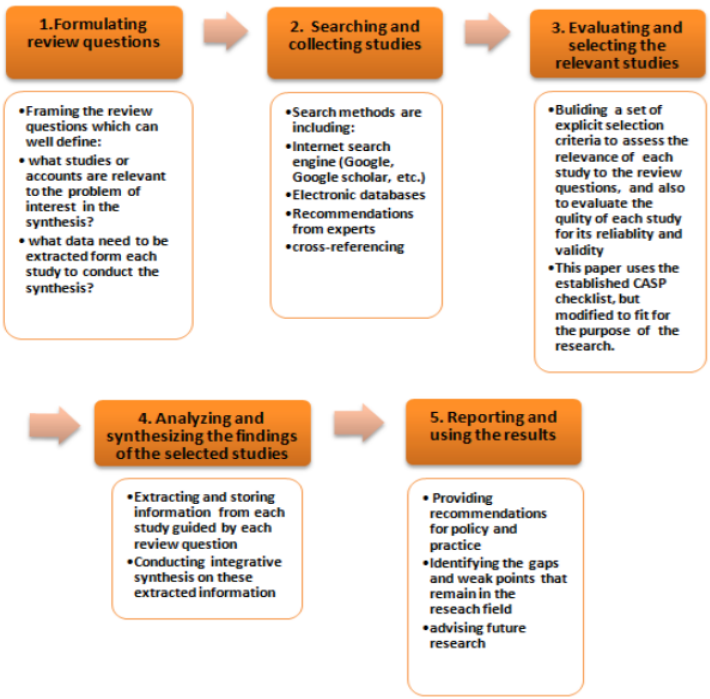
Appendices

Appendix 1. Survey results on the detection of negative factors for Ukraine's intermediacy

	Degree of Negative influence	Degree of Importance
Mean	3,5	3,6
Standart deviation	9,158594492	6,3328585

Area	#	Negative factors for Ukraine's intermediacy	Degree of Importance	Weighting factor	Degree of Negative influence	Final weighted score
General	1	bureaucracy procedures/ legal formalities	4,2	4,57%	4,4	0,20
	2	administrative barriers and delays	3,9	4,27%	4,2	0,18
	3	regulatory/administration	3,8	4,15%	3,5	0,15
	4	customs efficiency and delays	4,3	4,63%	4,4	0,20
	5	politics/government being an obstacle in the development of transport system	3,8	4,15%	4,2	0,18
	6	corruption (generated by the law executives)	4,8	5,17%	4,9	0,25
	7	legislative base and implementation practice for investments (rail, ports, inland water-ways)	3,9	4,21%	3,8	0,16
Ports	8	poor port legislation / policy	3,4	3,73%	3,3	0,12
	9	insufficient/old port terminal infrastructure	3,7	3,97%	3,2	0,13
	10	shortage of railway and road approaches to ports and dry ports	3,4	3,73%	3,1	0,12
	11	lack of dry ports	2,8	3,01%	2,7	0,08
	12	high port costs (ports dues and terminal fees)	3,9	4,21%	3,9	0,17
	13	high port THC	3,4	3,67%	3,3	0,12
Railway	14	poor railway legislation/ policy	2,7	2,95%	2,8	0,08
	15	shortage of rail infrastructure (roads + rolling stock and terminals)	3,8	4,15%	3,9	0,16
	16	inefficient and outdated operational work style of state railway company UZ	3,8	4,09%	4,0	0,16
	17	high railway costs in Ukraine	3,6	3,85%	3,6	0,14
	18	high railway costs in Georgia, Azerbaijan (as a factor of the whole supply chain of TRACECA corridor)	3,4	3,67%	3,4	0,13
	19	weak security of railway transport	2,9	3,19%	2,8	0,09
Inland naviga-tion	20	inadequate inland navigation legislation and policy	3,7	3,97%	3,6	0,14
	21	deficient inland waterways infrastructure	3,3	3,61%	3,3	0,12
	22	high inland waterways costs (ports, locks and bridges)	2,9	3,13%	2,9	0,09
	23	obligatory pilotage on Danube River	2,7	2,95%	2,4	0,07
Other	24	insufficient ferry services quality and their high costs on Caspian Sea (factor for TRACECA corridor)	3,1	3,31%	2,9	0,10
	25	Lack of logistic zones, warehouses in Ukraine	3,5	3,79%	3,1	0,12
	26	inferior existing road infrastructure	3,6	3,85%	3,6	0,14

Appendix 2. CASP methodology description



Source: Wang, S., & Notteboom, T. (2013)

Critical Appraisal Skills Programme is the process of accurate and systematical examination of the research to judge its trustworthiness, and its value and relevance in a particular case and context. The CASP aims to help researchers to cultivate the necessary skills to make sense of scientific evidence, and has developed appraisal checklists covering validity, results and relevance. The main steps of CASP methodology are represented in the graph bellow mainly (1) formulating review questions; (2) searching and collecting studies; (3) evaluating and selecting relevant studies; (4) analysing and synthesizing the findings of the selected studies; (5) reporting and using the results. For the step three of CASP methodology the following selection criteria were used to determine whether this paper will be included in our study: (i) both screening questions have to be answered positively (in table bellow in grey), and (ii) all key questions can't be answered with a "No". (in table bellow in blue).

Appendix 3. CASP literature review results

Area	#	Negative factors for Ukraine's intermediacy	times mentioned	Share from Total papers (64)
General	1	bureaucracy procedures/ legal formalities	36	56,3%
	2	administrative barriers and delays	35	54,7%
	3	regulatory/administration	36	56,3%
	4	customs efficiency and delays	32	50,0%
	5	politics/government being an obstacle in the development of transport system	23	35,9%
	6	corruption (generated by the law executives)	14	21,9%
	7	legislative base and implementation practice for investments (rail, ports, inland waterways)	38	59,4%
Ports	8	poor port legislation / policy	30	46,9%
	9	insufficient/old port terminal infrastructure	21	32,8%
	10	shortage of railway and road approaches to ports and dry ports	18	28,1%
	11	lack of dry ports	7	10,9%
	12	high port costs (dues)	15	23,4%
	13	high port THC	15	23,4%
Railway	14	poor railway legislation/ policy	30	46,9%
	15	shortage of rail infrastructure (roads + rolling stock+terminals)	21	32,8%
	16	inefficient and outdated operational work style of state railway company UZ	22	34,4%
	17	high railway costs in Ukraine	19	29,7%
	18	high railway costs in Georgia, Azerbaijan (as a factor of the whole supply chain of TRACECA corridor)	12	18,8%
	19	weak security of railway transport	9	14,1%
Inland navigation	20	inadequate inland navigation legislation and policy	22	34,4%
	21	deficient inland waterways infrastructure	16	25,0%
	22	high inland waterways costs (ports, locks and bridges)	12	18,8%
	23	obligatory pilotage on Danube River	4	6,3%
Other	24	insufficient ferry services quality and their high costs on Caspian Sea (factor for TRACECA corridor)	9	14,1%
	25	Lack of logistic zones, warehouses in Ukraine	19	29,7%
	26	inferior existing road infrastructure	13	20,3%

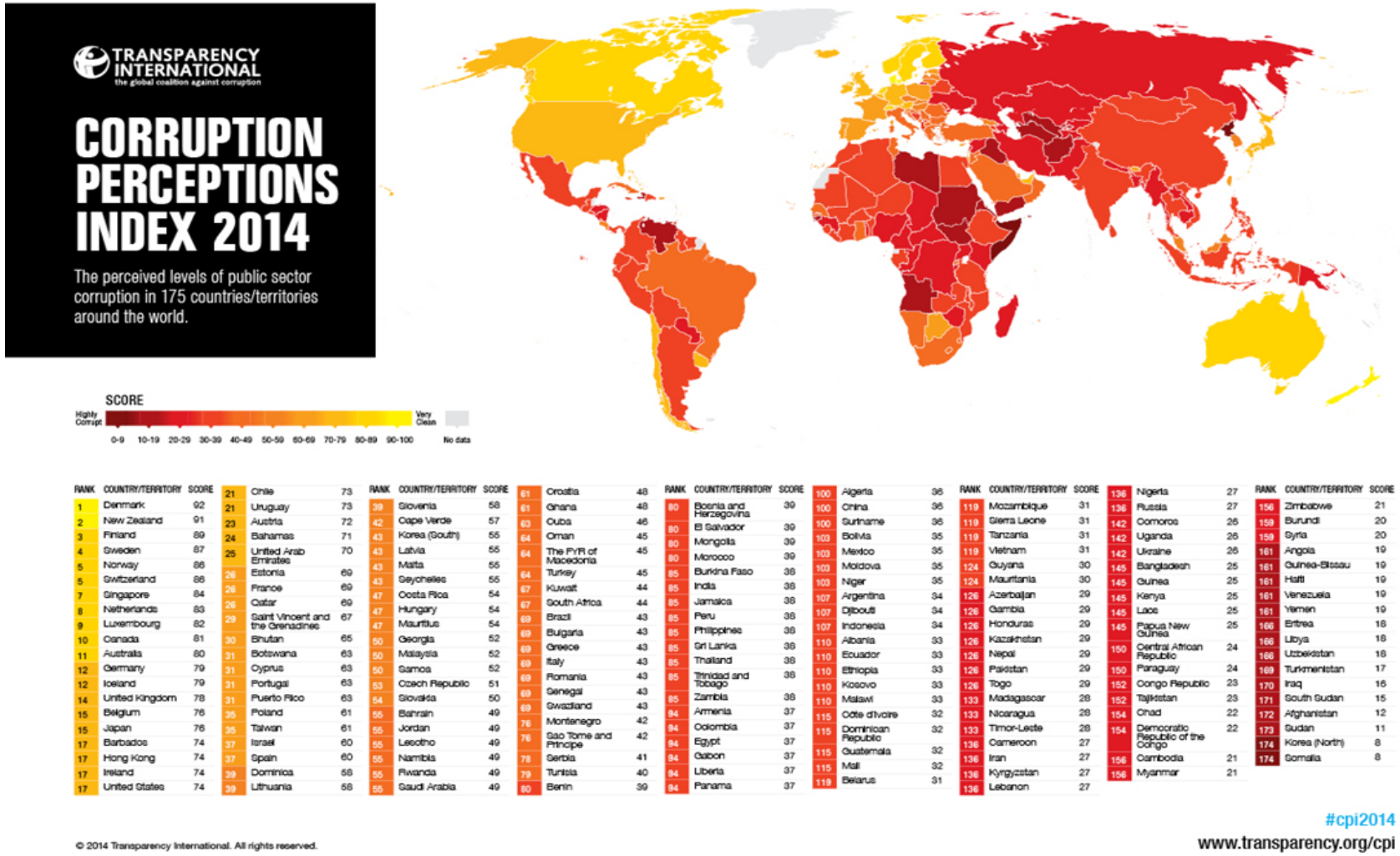
Appendix 4. Complete CASP check list

Study #	Title of Study	Author	Authority of authors
Reports (working papers, consultancy reports and other practitioner material)			
R1	Логистические процессы и морские магистрали II (No. ENPI 2011 / 264 459)	Egis International, & Dornier Consulting	Commission Of The European Communities
R2	Support to the transport strategy of Ukraine until 2020	Corporate Solutions, & Systra	European Union
R3	Traceca route attractiveness index TRAX road index calculation methodology (No. EuropeAid 2008/155-683)	TRT Trasporti e Territorio, Alfen Consult GmbH, Dornier Consulting GmbH and PTV AG.	European Union
R4	Working Group meeting on elaboration of common competitve tariffs within TRACECA Corridor	TRACECA Working Group	Permanent Secretariat of the Intergovernmental Commission TRACECA (PS IGC).
R5	Стратегия развития контейнерных перевозок в Украине - план действий	Container Lines Association of Ukraine (CLAU)	Container Lines Association of Ukraine (CLAU)
R6	The EU's Black Sea Synergy: results and possible ways forward	Directorate-General for external policies	Commission Of The European Communities
R7	Economic Analysis of the Warehousing & Distribution Market in Northwest Europe	Vonck, I., & Notteboom, T	ING Bank and ITMMA – University of Antwerp.
R8	Regional Cooperation in the Black Sea Area: Analysis of the Opportunities to Foster Synergies in the Region	Nikolov, K.	European Parliament Committe on Foreign Affairs
R9	Transport and trade facilitation issues in the CIS 7, Kazakhstan and Turkmenistan	Molnar, E., & Ojala, L.	The World Bank
R10	Optimisation of Central Asian and Eurasian Inter-Continental Land Transport Corridors (Draft EUCAM Working paper No. 20916)	Emerson, M., & Vinokurov, E.	University Library of Munich, Germany
R11	On implementation of the Strategy of the Intergovernmental Commission TRACECA for development of the intern ational transport corridor 'Europe-the Caucasus-Asia' (TRACECA) for the period up to 2015 (Action plan)	TRACECA Working Group	Permanent Secretariat of the Intergovernmental Commission TRACECA (PS IGC).
R12	Розробка рекомендацій по створенню операторської мультимодальної компанії перевізника "Укрзалізниці"	Pidlisny, P. I.	Kiev State Economy and Technology University of Transport.
Papers (Master thesis, papers and articles)			
P1	Ukrainian and Russian waterways and the development of European transport corridors	Doubrovsky, M.	Odessa National Maritime University
P2	Transit potentialof Ukraine, post crisis strategy	Nechaev, G., Izotov, S., & Kaver, I.	East Ukrainian National University, Lugansk, Ukraine
P3	Ukraine in the system of Baltic Sea - Black Sea transport and logistic integration	Smirnov, I. G.	Kiev National University
P4	Transformation directions of the transport-technological systems at the Black Sea region	Kukharchik, V. G.	Institute for Market Economics and Economical Environmental Studies of the National Academy of Sciences of Ukraine
P5	The development of transportation and technological systems in Ukraine: the conceptual framework	Kotlubay, A.	Institute for Market Economics and Economical Environmental Studies of the National Academy of Sciences of Ukraine
P6	Basic questions are in relation to forming and support of streams of transits in ports of Ukraine	Kotlubay, A.	Institute for Market Economics and Economical Environmental Studies of the National Academy of Sciences of Ukraine
P7	Increase of tranzit Ukraine through the terminals of the Black Sea region.	Vinnikov, V. V.	Institute for Market Economics and Economical Environmental Studies of the National Acade-

			my of Sciences of Ukraine
P8	Modern progress trends of Ukraine transit potential.	Ilchenko, S. V.	Institute for Market Economics and Economical Environmental Studies of the National Academy of Sciences of Ukraine
P9	Strategic direction of development of container transport technological system of Ukraine	Vaskov, Y., & Opanchuk, B.	USPA and Institute for Market Economics and Economical Environmental Studies of the National Academy of Sciences of Ukraine
P10	Principles of development of the transport-transit potential of the primorskiy region	Primachev, N., & Baryshnikova, V.	Odessa National Maritime Academy and Odessa National Maritime University
P11	Development of transit and socio economical potential of eastern Ukraine on the example of Lugansk region.	Slobodyanyuk, M., & Lapaeva, E.	Dahl East-Ukrainian National University, Lugansk, Ukraine
P12	Economic –legislation framework of marine international trading and transit transportations in Ukraine	Lipinskaya, A., & Yarmolovich, D.	Institute for Market Economics and Economical Environmental Studies of the National Academy of Sciences of Ukraine
P13	Механизмы ОЧЭС в стимулировании транзитных возможностей хозяйственной составляющей морских портов Украины.	Makogon, Y. V.	NISR in Donetsk, Ukraine
P14	Measures Supporting Better Trade and Transport between Asia and Europe (Vol. 43, p. 14)	Hamidreza, B.	Transportation Research Institute, Tehran, Iran
P15	Warehousing Location Decision in Northern Europe: Transportation Mode Perspective	Hilmola, O.P.	Technical University of Kosice
P16	Transit Transport Between the European Union and Russia in Light of Russian Geopolitics and Economics	Laurila, J.	Institute for Economies in Transition (BOFIT)
P17	The Policy of Ukraine Towards the BSEC and the Black Sea Region. Unfolding the Black Sea Economic Cooperation	Perepelytsia, G.	International Centre for Black Sea Studies (ICBSS), Athens, Greece
P18	Ukraine's window to the West: The role of international railway connection in Transcarpathia (Zakarpattia)	Savchuk, I. G.	Institute of Geography of the National Academy of Sciences of Ukraine
P19	Intermodal transport in the transport corridor Gdansk-Odessa	Palmowski, T.	University of Gdansk
P20	Тарифная система железных дорог в условиях реформирования отрасли	Verlan, A., Kozachenko, D., & Kutaladze, O.	Terminals TIS Group
P21	За речной логистикой — будущее.	Skichko, Y.	Hermes trading
P22	Паромные перевозки Балтики и Черного моря	Morgenshtern R.	Ukrferry
P23	Реформа в портах Украины будет продолжена	Petrov, A.	Ports of Ukraine
P24	«Нет!» — коррупции.	Mikhailova, V.	Ports of Ukraine
P25	Тарифная политика железных дорог	Kutaladze, O., Kozachenko, D., & Varlan, A.	Terminals TIS Group
P26	Максим Бурбак: вернуть транзит и доверие инвесторов	Mikhailova, V.	Ports of Ukraine
P27	Будущее транспортной системы в Украине	Mikhailova, V.	Ports of Ukraine
P28	Упростить механизмы реализации инвестиционных планов	Vaskov, Y.	USPA
P29	«Дорожная карта» развития морехозяйственного комплекса.	Klimpush, O.	
P30	Транспортно-логистическая система Украины и транспортные коридоры	Zubkov, V.	PLASKE and UKRPORT
P31	Стратегия развития контейнерных перевозок в Украине	Clenciu, S.	Container Lines Association of Ukraine (CLAU)
P32	«Maritime Days in Odessa–2014»: время перемен	Ilnitskiy, K., & Mikhailova, V.	Ports of Ukraine
P33	Черноморский контейнерный саммит - 2014	Containersummit	Ports of Ukraine
P34	Port and terminal development plans for containers and dry bulk in Ukrainian ports market players, estimated demand and capacities	Grushevska, K.	ITMMA, University of Anwterp

P35	SWOT analysis of the Sea Ports in the Black Sea-Azov basin	Navrozova Yu.A., Grushevska K.V.	Odessa National Maritime University
P36	An Economic and Institutional Analysis of Multi-Port Gateway Regions in the Black Sea Basin	Grushevska, K., & Notteboom, T.	ITMMA, University of Anwterp
P37	Dry bulk cargo in Ukrainian ports	Grushevska K., Notteboom T.	ITMMA, University of Anwterp
Conferences			
C1	Development of transport infrastructure in Republic Of Kazakhstan till 2020	Ministry of infrastructure in Republic Of Kazakhstan	Ministry of infrastructure in Republic Of Kazakhstan
C2	Development and Future Prospects of cargo Transportation by Viking Intermodal Freight Train	LISKI multimodal operator	LISKI multimodal operator
C3	Ukrferry's ferry services: current state of affairs and new projects	Ukrferry	Ukrferry
C4	The role and site of the Dnieper River within the framework of the foreign trade logistics of the Black Sea Region	Ukrrechflot	Ukrrechflot
C5	Sea ports of Ukraine	Panaskiuk Alexey	USPA
C6	DB Schenker in CIS – Challenges, Prospects	Leuschner Uwe	DB Schenker
C7	Development of Corridor Logistics – Logistics Networks in Transport Corridors	Sonntag Herbert	Technishe Hochschule Wildau
C8	Prospects and Challenges of Rail Ferry and Ro-Ro Shipping between TRACECA Countries in the Caspian Basin	Gueriot Michel	LOGMOS project
C9	Maritime Links in the Caspian Sea Towards an organized network	Gueriot Michel	LOGMOS project
C10	LOGMOS Master Plan Recommendations on Soft Measures and Trade Facilitation	Sellner Falko Josef	LOGMOS project
C11	LOGMOS Master Plan Recommendations on Regular container block train operations between the Black and Caspian Seas and from Central Asia to the Black Sea	Schoen Andreas	LOGMOS project
C12	LOGMOS Master Plan Recommendations on Development of Logistics centres in TRACECA	Schoen Andreas	LOGMOS project
C13	Prospects and Challenges of Rail Ferry and Ro-Ro Shipping etween TRACECA Countries in the Caspian Basin	Gueriot Michel	TRACECA project

Appendix 5.



RANK	COUNTRY/TERRITORY	SCORE
1	Denmark	92
2	New Zealand	91
3	Finland	89
4	Sweden	87
5	Norway	86
5	Switzerland	86
7	Singapore	84
8	Netherlands	83
9	Luxembourg	82
10	Canada	81
11	Australia	80
12	Germany	79
12	Iceland	79
14	United Kingdom	78
15	Belgium	76
15	Japan	76
17	Barbados	74
17	Hong Kong	74
17	Ireland	74
17	United States	74
21	Chile	73
21	Uruguay	73
23	Austria	72
24	Bahamas	71
25	United Arab Emirates	70
26	Estonia	69
26	France	69
26	Qatar	69
29	Saint Vincent and the Grenadines	67
30	Bhutan	65
31	Botswana	63
31	Cyprus	63
31	Portugal	63
31	Puerto Rico	63
35	Poland	61
35	Taiwan	61
37	Israel	60
37	Spain	60
39	Dominica	58
39	Lithuania	58
39	Slovenia	58
42	Cape Verde	57
43	Korea (South)	55
43	Latvia	55
43	Malta	55
43	Seychelles	55
47	Costa Rica	54
47	Hungary	54
47	Mauritius	54
50	Georgia	52
50	Malaysia	52
50	Samoa	52
53	Czech Republic	51
54	Slovakia	50
55	Bahrain	49
55	Jordan	49
55	Lesotho	49
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55	Rwanda	49
55	Saudi Arabia	49
61	Croatia	48
61	Ghana	48
63	Cuba	46
64	Oman	45
64	The FYR of Macedonia	45
64	Turkey	45
67	Kuwait	44
67	South Africa	44
69	Brazil	43
69	Bulgaria	43
69	Greece	43
69	Italy	43
69	Romania	43
69	Senegal	43
69	Swaziland	43
76	Montenegro	42
76	Sao Tome and Principe	42
78	Serbia	41
79	Tunisia	40
80	Benin	39
80	Bosnia and Herzegovina	39
80	El Salvador	39
80	Mongolia	39
80	Morocco	39
85	Burkina Faso	38
85	India	38
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85	Peru	38
85	Philippines	38
85	Sri Lanka	38
85	Thailand	38
85	Trinidad and Tobago	38
85	Zambia	38
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145	Papua New Guinea	25
150	Central African Republic	24
150	Paraguay	24
152	Congo Republic	23
152	Tajikistan	23
154	Chad	22
154	Democratic Republic of the Congo	22
156	Cambodia	21
156	Myanmar	21
156	Zimbabwe	21
159	Burundi	20
159	Syria	20
161	Angola	19
161	Guinea-Bissau	19
161	Haiti	19
161	Venezuela	19
161	Yemen	19
166	Eritrea	18
166	Libya	18
166	Uzbekistan	18
169	Turkmenistan	17
170	Iraq	16
171	South Sudan	15
172	Afghanistan	12
173	Sudan	11
174	Korea (North)	8
174	Somalia	8

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