# Effects of infrastructure extension on the competitiveness of Hungarian logistics providers

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Abstract:    As based on international rankings, like the Global Competitiveness Index and the Logistics Performance Index, the competitiveness of Hungary has decreased recently. The present article investigates the correlation between the above mentioned indices, and explores the underlying reasons and aims motivating the railway network extension (bypass line V0), while also considering its possible future effects on the Hungarian logistics providers and the economy on the whole.

*Keywords: competitiveness, railways, LPI, GCI*

## 1. Introduction

The competitiveness of Hungary has seriously decreased in the last years. The World Economics Forums (WEF) ranks the countries each year according to their competitiveness; their respective study in 2012 comprised 144 countries and 111 indicators. In 2011, Hungary was 29th from the 130 states investigated, while it was only ranked 60th this year [21]. Accepting the judgement of Chikán it can be stated that "regarding the post socialist countries, Hungary who had been among the leaders has now joined those lagging behind" [7]. Being aware of the importance of having "responsible supply chains", through LPI, the authors examine the effect of the V0 railway network extension to the country's competitiveness, while also keeping in mind that shift to railways is a vital goal of the European transport strategies as well [10, 11].

## 2. International rankings

### 2.1. Rankings in GCI and LPI

"Quality of the railway infrastructure" is one of the indicators measured as part of the World Economic Forum's Global Competitiveness Index. Here, with mark 4.4, Hungary is ranked 50th and the level of insufficiencies has increased to one and a half of the value of two years ago, nearly reaching the level measured in 2008.

1

Parallel to the World Economic Forum, the World Bank has also conducted a survey ranking countries, but with a different approach. The survey to determine the Logistics Perfomance Index (LPI) was carried out three times since 2007 including 150 countries worldwide and ranking the states from a logistics perspective. The LPI evaluates the countries as based on 6 indicators. One of these indicators is the quality of infrastructure, in which Hungary was rated 35th, 52nd and 40th in 2007, 2010 and 2012, respectively [1]. The scores characterizing the quality of infrastructure in Hungary were the following: 3,12 (2007), 3,08 (2010), 3,14 (2012), while the maximum value was 5.

### 2.2 Correlation between the rankings

The question arises whether there is a correlation between the LPI index and the (WEF) competitiveness index of Hungary. If an increase in the individual indicators of LPI can be achieved, will this also influence the WEF competitiveness index? Chikán argues that this hypothesis should be true. According to his opinion, "the logistics performance of Hungary is equal to its general competitiveness", and in boosting logistics, there is an unused potential for competitiveness at hand [9].

Figure 1. shows the respective ranking weights for Hungary on a year by year basis. It has to be noted, that the LPI values are only available for years 2007, 2009 and 2011, as it was only in these years that the LPI survey was carried out. Hence, the weights indicated with a cross in the diagram have been calculated by means of interpolation, so as to enable the correlation to be calculated and presuming that the values have changed linearly between the measured data points.
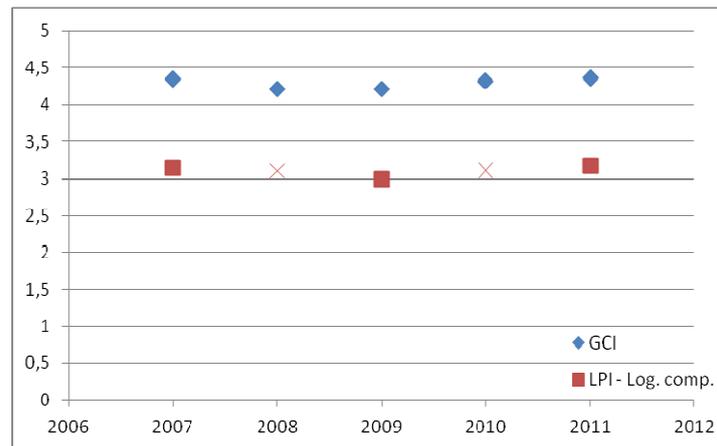


*Figure 1. Measured and calculated GCI and LPI values of Hungary*

The function utilized for calculating the interpolated values is the following:

$$y = 0{,}005x - 6{,}9417 \qquad (1)$$

Correlation (*r*) between the two data series has been calculated according to the following, usual function:

2

$$r_{xy} = \frac{\sum_{i=1}^{n}(x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_{i=1}^{n}(x_i - \bar{x})^2 \sum_{i=1}^{n}(y_i - \bar{y})^2}}$$

(2)

where *n* is the sample size, and *x, y* are the data from the two series.

The correlation found between the two series shown in Figure 1. is 82.70%, meaning that indeed, there is a very close relationship between the GCI and LPI values, and it can be rightly assumed that an increase in LPI will entail an amplification of the GCI value as well. Thus, what has been introduced as the opinion of the expert, has also been proven by the result of objective evaluations as well.

## 3. Effects of V0 infrastructure development

### 3.1. The need for constructing a bypass line

A further question to be asked is, whether there is a correlation between railway network extension, meaning especially V0, and the country's rank at the LPI list, and thus also between the infrastructure development and the GCI ranking. According to the opinion of the relevant experts and stakeholders, this is necessarily so.

Hungary is in competition with the other, neighbouring, countries, and "if we are fumbling around, the significant international logistics providers will sidestep Hungary, as the neighbouring countries are not wasting their time in this context"- expressed the secretary of state, *János Fónagy*, at the Transport Logistics Conference. The development of railway infrastructure is decisive for Hungary, as precise and reliable rail transport is essential for the development of big industrial enterprises and this also influences their stay in the country [2].

It is also well known from experts, that there is a serious lack of capacity at the Hungarian railways: it takes a train in average 18 hours to cross the country [13]. If the plans to build a new railway line (V0) bypassing the capitol, thus alleviating railway traffic density on the networks in and around Budapest, will be realized, the above mentioned timeframe may be reduced to 6 hours [15]. It is important to note that the new network section should from the beginning be able to cater for the transport of trains with an axle load of 22.5 tons [17].

The board of directors of the Hungarian Logistics Service Centres' Association (MLSzKSz) finds that the targeted development of the logistics sector is inevitable for maintaining and strengthening the regional competitiveness of Hungary [20]. Logistics is capable of increasing the competitiveness of the economy: by reducing the transaction costs and the general cost level of the economy, and by providing customer services of higher added value and service export it can boost economic growth and it can contribute to Hungary's competitiveness by also taking advantage of the expansion of the logistics market [9]. According to the opinion of MLSzKSz, the potential for excellence of the Hungarian transport logistics sector lies in building the railway bypass line (V0), in enhancing the logistics competitiveness of the Záhony region, in improving

3

the Hungarian situation of intermodal (combined) transport, and in further developing the logistics service centres [20].

### 3.2. Details of the planned network extension

The first railway line in Hungary was inaugurated on 15<sup>th</sup> July 1846, and looking at the map of the Hungarian-Austrian Empire from the era, it is evident, that even at that time there were efforts to ease the burden of traffic in the middle of the country [3].

At the moment the feasibility study of V0 considers two different versions: one northern-southern and a southern line. It is planned to create an electrified, double-track line, fulfilling the highest expectations regarding quality, with a speed limit of 160 km/h, and an axle load of 225 kN on the whole length of the track. According to the present plans, V0 will connect *Komárom* and *Szolnok*, passing Székesfehérvár (or northern to that, in the region of *Bicske* and *Ercsi*), crossing the river *Danube* on a new bridge, and meeting the main railway line No. 100 by *Cegléd*. Depending on the alternative chosen, it requires the investment of 270 to 600 billion HUF and the length of the line will be 190 to 280 km [4]. The project is to be financed from national and European sources.

Provided that the necessary governmental level decisions are reached and both the financial resources and the necessary land are available, the constructions can be started in 2017, and the line would be finished in 2023 at the soonest [15].

### 3.3. Discussion and effects of the railway extension

Developing railway speed and axle load features among the transport development priorities of the New Széchenyi Plan, thus, this project matches the goals of Hungarian economic development perfectly. The observed international tendencies favour the Hungarian situation [9]. This international tendency is also backed up by the strategy of Rail Cargo Hungária (RCH), which highlights that by the stabilization of the international economy, rail freight transport will develop and the eastern and south-eastern markets will gain importance [16]. Implementing V0 will largely contribute to the success of the strategic endeavours of RCH.

The executive board of RCH was assigned with the task of designating as many trains as possible through Romania and Bulgaria, aiming at the Greek, but even more importantly at the Turkish markets, in order to expand in southeast Europe. At present, this goal is to be fulfilled through Hungary. However, after the successful privatization of Croatian and Serbian companies, deploying an "own" rail freight company and getting round Hungary in order to serve the Balkan region may prove to be an alternative.

Naturally, the new executive board of MÁV (Hungarian Railways) does not want to lag behind either, and it takes "firm steps to ensure that the goods arriving from Asia to Europe are transported through the Hungarian railway network. By means of the related track access fees, this may yield an important revenue for Hungary" [8]. During the meeting of the *Coordinating Council on Trans-Siberian Transportation*, *Ilona Dávid*, Head of the Hungarian Railways, met *Vladimir Yakunin*, Head of the Russian Railways

4

and they agreed to elaborate measures that, among others, make a better use of the Hungarian transit and logistics opportunities" [8].

The question can be asked, whether international competitiveness can be seen as a notion in itself or is Paul Krugmann right in saying that it is really the companies which compete with each other [6]. Demján argues, that the competitiveness of the enterprises is determined by the social costs [19]. As based on these opinions, it can be stated that the competitiveness of the companies and the countries are strongly interdependent, and "the questions regarding international competitiveness, be they political or economic, are becoming more and more of a cultural nature" [12]. The halt of project to be outlined in the next paragraph may also be attributed to the problem of cultural differences.

Looking at the development endeavours of the neighbouring countries, the states of the region can be observed to be participating in several infrastructure development projects in order to enhance their competitiveness. One outstanding example is the fact that there are preparations going on for building the wide gauge track *Kosice-Bratislava-Vienna* crossing Slovakia [5]. According to plans, this would be the European part of a 8000 km long wide gauge track, along which 16 million tons of goods would be transported annually from Chinese metropolises (*Beijing, Shanghai*) and from Vladivostok to Europe, with a transport time of 15 days.

Due to the high investment costs, the hesitating attitude of the Russians and the loss of potential of the Slovaks (the added value logistics activities in *Ágcsernyő* are being transformed into transit services), and also despite the strong Austrian intentions, the project has come to a halt. It remains to be seen what financial resources will be deployed to realize the project. It is highly probable, that the private investments and the subsidiaries given by the individual countries will not be sufficient, and the support of the European Union will be required. These resources are also limited, and the support provided by the Cohesion Fund may be reduced by 20-25% in the next budget period of the EU (2014-2020).

Consequently, it can be stated that Hungary and the neighbouring countries will have to exert an intensive lobbying effort and compete with each other to secure funds from the European Committee on Budgets, so as to realize projects enhancing their competitiveness. Analysing the data from the past years, it can be presumed that the Slovak project, if it is carried out, will be of vital influence to the LPI of the countries concerned, and thus, also to the competitiveness of the given countries.

The expected positive effects of the Hungarian railway network extension (the V0 bypass line) are the following:
- V0 will be able to alleviate the traffic of the Southern railway bridge connecting *Kelenföld* and *Ferencváros*, which is a line passing close to the centre of *Budapest*;
- it enables the increase of rail freight performance by at least 10% annually;
- it might trigger economic activity in the region of *Szolnok* and *Debrecen*. These economic regions might become quicker to reach from the ports of the Adriatic and the Northern Sea. The reduction in travel times may be hours, or even days. The *Szolnok Regional Logistics Centre*, operated by *BI-KA Logisztika Kft.* has already started reactivating its industrial railway line, and

has prepared several Memorandums of Understanding, which will enable serving its partners on rail and which will contribute to the growth of rail freight transport in the region [18];

- it creates the basis for logistic investments in the *Záhony* region as well [15];
- it enhances the logistics competitiveness of Hungary and it contributes to positioning Hungary as an important transit corridor;
- it facilitates Hungary becoming the logistics centre of Central and Eastern Europe;
- it improves the situation of intermodal (combined road – rail – inland waterways) transport, thus enabling the development of a modern transport system. It improves the competitiveness of transit rail freight transport and revitalizes the inner rail transport market. By shifting a part of road freight transport to railways and inland waterways, it reduces maintenance costs, the quality of roads will not deteriorate as rapidly and the extent of emissions (air pollutants and noise) will also be reduced, just as well as the risk of accidents triggered by the presence of trucks on the roads [14];
- the building of V0 bypass line may be the most important development of the railway infrastructure in the next two decades. The project may provide work for the Hungarian labour force and for Hungarian enterprises.

## 4. Conclusions

Hungary has a favourable geopolitical position, which may support the strategic aim of becoming the logistics centre of the Central-European region. To reach this goal, however, considerable investments shall be carried out in the field of transport and logistics infrastructure. One of the major investments planned is the realisation of V0 railway line, which facilitates the increase of rail freight transit going through Hungary. There are other positive effects of this infrastructure development, which have been analysed in detail.

The evaluation of GCI and LPI data has shown that there is a correlation between competitiveness and the state of transport/logistics infrastructure. That is why it is an important task of policy makers to pay special attention to the development of infrastructure elements playing a determining role in the logistics market. Such an improvement can be in Hungary the railway line development described above. Nevertheless, before starting the project it is worth investigating its impacts not only on competitiveness but also on efficiency [15].

# References

[1] Arvis, J.-F., Mustra, M.A., Ojala, L., Sheperd, B., Saslavsky, D.: *Connecting to Compete 2012, Trade Logistics in the Global Economy, The Logistics Performance Index and Its Indicators*, The International Bank for Reconstruction and Development/The World Bank, Washington (2012).

[2] Ádám, V.: *The government might decide about V0 next year* (In Hungarian: Jövőre dönthet a kormány a V0-ról), in: Napi Gazdaság, 2012.01.24. Vol. 22. No. 204. p. 10.

[3] Balla, L.: *The railway map of the Austrian-Hungarian Monarchy, 1890.* (In Hungarian: Az osztrák-magyar monarchia vasúti térképe (1890)). (2009) (URL: www.vasut.hu accessed at 06/11/2012)

[4] Berki, Zs.: *Proposed technical solutions, tracks and environmental challanges of the railway line bypassing Budapest from the South* (in Hungarian: Budapestet délről elkerülő vasúti körgyűrű – V0 – Javasolt műszaki megoldásai, nyomvonalvezetése, környezetvédelmi kihívásai). International Conference of Transport Logistics, organized by the Association of Hungarian Logistics Service Centres, Velence, 11-12. Oct. 2012.

[5] Breitspur Planungsgesellchaft (URL: www.breitspur.com, accessed at 5/11/2012)

[6] Chikán, A.: *Those lagging behind will not have a chance to win* (In Hungarian: Aki leszakad, annak nulla az esélye a győzelemre),27/09/ 2012 (URL: http://www.vg.hu/gazdasag/gazdasagpolitika/chikan-aki-leszakad-annak-nulla-az-eselye-a-gyozelemre-387524, accessed at 5/11/2012)

[7] Chikán, A.: *Restructuring and consolidation in the Hungarian economy and economy management* (In Hungarian: Átalakulás és konszolidáció a magyar gazdaságban és gazdaságirányításban*), in 50. Közgazdász Vándorgyűlés, Eger, (2012) p. 20.

[8] Chikán, A.: *The goal of MÁV is to shift Asian-European transit rail freight to the Hungarian railway sector* (In Hungarian: A MÁV célja az Ázsia-Európa tranzit-áruforgalom magyar vasúti pályára terelése, in: Logisztikai Híradó Oct. 2012.Vol. XII. No. 5. p. 3.

[9] Chikán A.: *Logistics perspectives of Hungary – a macroeconomic approach (*In Hungarian: Magyarország logisztikai perspektívái – makrogazdasági megközelítés), Az MLBKT Oktatói Tagozata és a Szolnoki Főiskola közös rendezésű jubileumi rendezvénye, Szolnok, 27/11/2011

[10] European Commission: *White Paper: Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system,* COM (2011) 144 Final, Brussels, 28.3.2011.

[11] European Commission *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Horizon 2020 - The Framework Programme for Research and Innovation* COM (2011) 808 Final, Brussels, 30.11.2011.

[12] Fukuyama, F.: *Trust – The Social Virtues and Creation of Posperity* (in Hungarian: Bizalom - A társadalmi erények és a jólét megteremtése.) Európa Könyvkiadó (2007). p. 17.

[13] Kocsis,L., Török, Á.: *Travel time based railway assessment* (In Hungarian: Idő alapú vasúthálózati értékelési eljárás), Közlekedéstudományi Szemle Vol. LXI No.3. (2011) pp. 54-59.

[14] MTI/hvg.hu: *The V0 railway bridge might cost 600 billion* (In Hungarian: 600 milliárdba is kerülhet a V0-s vasúti híd) 10/10/2012 (URL: http://hvg.hu/gazdasag/20121010_V0_as_vasuti_hid, accessed at 30/10/2012)

[15] Markovits-Somogyi, R.; Karmazin, Gy.; Bokor, Z*.: Efficiency of Rail Freight Transport in Central and Eastern European Countries,* Horizons of Railway Transport, 2012 (accepted for publication)

[16] Raktaram.hu (2012): *MÁV should also be heading for the Balkan?* (In Hungarian: A MÁV-nak is nyomulnia kéne a Balkánra? *12/06/*2012 (URL: www.raktaram.hu/raktarpiac/a-mav-nak-is-nyomulnia-kene-a-balkanra/30801, accessed at 6/11/2012)

[17] Takács, M.: *V0, the railway line bypassing Budapest from the South – How will the new pricing scheme and the new institutional, organizational and regulatory system affect the competitiveness of the Hungarian rail freight sector?* (In Hungarian: Budapestet délről elkerülő vasúti körgyűrű – V0 - Megvalósítása kapcsán kialakítandó új vasúti díjstruktúra, intézményi, szervezeti, szabályozási rendszer milyen hatással lehet a magyar vasúti áruszállítás versenyképességére). International Conference of Transport Logistics, organized by the Association of Hungarian Logistics Service Centres, Velence, 11-12. Oct. 2012.

[18] Újvári,M.: *Trust is the most important factor in the business as well* (In Hungarian: Az üzletben is a bizalom a legfontosabb)**,** in: Világgazdaság 31. Oct. 2012. Vol. 44. No. 209. p. 6.

[19] Újvári,M.: *There seem to be no chances for a quick growth* (In Hungarian: Nem látszik esély a gyors fejlődésre), in: Világgazdaság, 9/11/2012. Vol. 44. No. 214. p. 6.

[20] Újvári,M.: *Our competitiveness is at stake, development is inevitable* (In Hungarian: Veszélyben versenyképességünk, a fejlesztés elkerülhetetlen), in: Világgazdaság, Logisztika Melléklet, 19/10/2012. Vol. 44. No. 203. p. 5.

[21] World Economic Forum: *The Global Competitiveness Index 2012-2013 Data Platform* (2012) (URL: http://www.weforum.org/issues/competitiveness-0/gci2012-data-platform/ Last accessed: Nov. 2012).