

# **Institutions, Globalization and Trade**

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COMPETIO BOOKS 14.

Kiadja: Debreceni Egyetem, Közgazdaság- és Gazdaságtudományi Kar, 2014

*Reviewer:*

JÓZSEF GÁLL

*Proof-reading:*

GEORGE SEEL

ISBN 978-963-473-725-4

Nyomdai előkészítés: Gyarmati Imre

Készült a CenterPrint Kft. nyomdaüzemében.

Felelős vezető: Szabó Sándor

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## **Preface**

This volume has been published to commemorate the 80<sup>th</sup> birthday of István Mustó, former Honorary Professor of the Faculty of Economics at the University of Debrecen. It contains 7 contributions written by scholars of the Faculty, covering issues relating to the way in which various institutions affect economic performance, what characterizes international trade in our globalized world and how employment and trade promote economic development.

Debrecen, June 30<sup>th</sup>, 2014.

*The Editors*



Pál Czeglédi

# Why Are the Institutions of Civil Liberties “Stickier” than Economic Freedom? The Role of the Enforcement Cost of Market Rules<sup>1</sup>

## 1. Introduction

Long-run economic development is usually examined in a comparative way – countries are compared for a certain period of time or over several periods of time. Such empirical examinations show that economic freedom and political freedom are correlated (Lawson and Clark 2010), or – to put it very simply – democratic countries tend to be free economically. It is not difficult to see the importance of the quest to understand why this is so. Even if the intrinsic value of both kinds of freedom is set aside, it is still true that economic development is enhanced by economic freedom. It is thus not difficult to predict that the economics literature – theoretical as well as empirical – of the economic freedom-political freedom relationship is extensive.

The aim of this paper is to deal with the role of informal institutions or culture<sup>2</sup> in understanding this relationship between the two kinds of freedom, or more precisely, between civil liberties and economic freedoms. The particular fact to the understanding of which this paper is trying to contribute is that civil liberties are “stickier” than economic freedom: civil liberties seem to be determined by cultural factors to a larger extent than economic freedom is.

The paper will develop a very simple model of constitutional choice to understand this fact, by making the fundamental assumption that while citizens can determine the scope of rights to be enforced and the level of resources which should be spent to enforce them, they cannot control rent seeking in other ways. With the help of this kind of simple model I will develop a hypothesis according to which informal factors

<sup>1</sup> This research was supported by the Hungarian Scientific Research Fund (contract no: 84030).

<sup>2</sup> These two terms are used as synonyms in the paper and are understood as the way people interpret the world around us (Denzau and North 1994). I will also use “attitudes” and “ideology” to describe the same concepts, although they may be given different meanings elsewhere. As for the aim of this paper, however, what is important is that all these factors shape human behaviour informally – without any formal punishment from a third party (Kasper, Streit, and Boettke 2012: 100-118). That is, in this paper I ignore the question of how deep these informal factors can be; what is important is that they are informal.

determining the preferences over market and non-market allocation will have an effect on the scope of rights the government will provide its citizens with.

In section 2 I will present some evidence showing that there really are differences between the stickiness levels of the two kinds of freedoms. In section 3 I will develop a simple model to explain that fact. Section 3.1 explains the main assumptions I make, section 3.2 develops the formal model, and section 3.3 shows that the predictions are in line with this stickiness puzzle. Section 4 then concludes.

## **2. The stickiness of economic and civil freedom**

There are a number of theories in economics explaining the ‘culture matters’ claim. Here I am focusing only on the one that explains the role of culture through institutional stickiness. This is to propose, in sum, that “culture and the imprint of history determine which rules can *stick* in certain environments” (Boettke 2001: 257, emphasis in original). The reason why culture or ideas matter is that they shape formal institutions and their enforcement. On the one hand “culture” must legitimate the formal rules (Boettke 2001, Boettke et al. 2008, Schwartz 2008: 35-36). On the other hand, ideas “shape the goals and expectations of ‘political entrepreneurs’” (Tarko 2013: 4), who play an important role in bringing about institutional change.

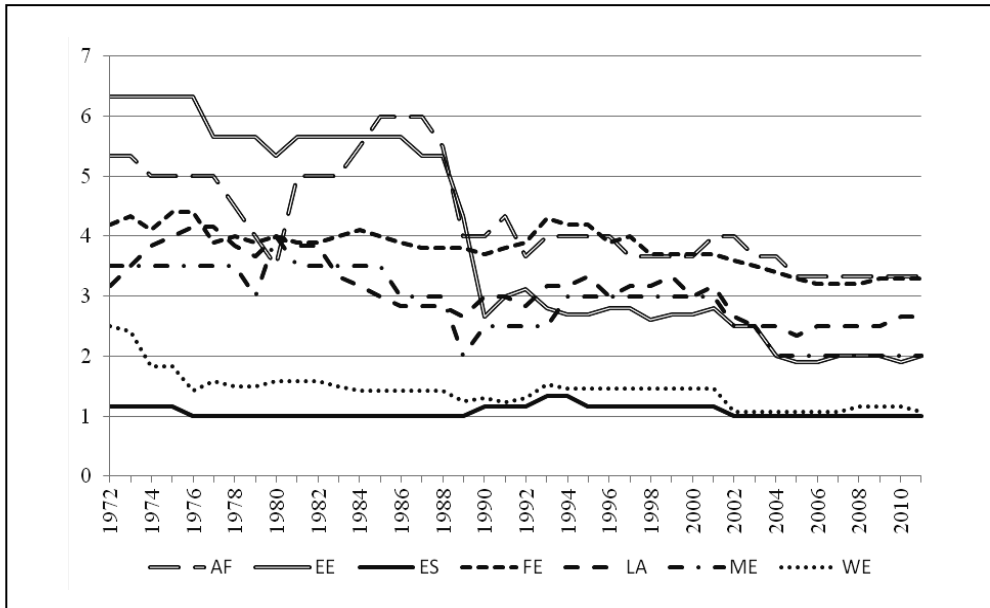
In addition, although both are a result of formal institutions, some evidence shows that civil liberties are stickier than economic freedom. Using unit roots tests, Sobel and Coyne (2011: 121) find, for example, that these “measures [those included in the civil liberties score of the Freedom House] go beyond constraints on government and also focus on individuals outside the public arena. As such, they capture many elements of embedded informal institutions, including traditions, religion, and customs, and we would expect changes in these institutional measures to be slower or less likely to occur.” Their conjecture is reinforced by the fact that contrary to many other institutional measures, the time series of civil liberties (and of political rights) is stationary. This is an indirect corroboration for the assumption that this measure is driven by deep-seated institutional factors which are mainly informal.

Figure 1 and 2, illustrate this fact by showing the time series of civil liberties (Freedom House 2013) and economic freedom (Gwartney, Lawson and Hall 2013) for different cultural regions of the world identified by Schwartz (2006, 2008) and Licht et al. (2007). What is clear is that there are persistent institutional differences between these regions, even when these very broad institutional bundles are considered. Clearly, there are changes in both kinds of freedom in time, even within the same cultural region. No theory proposes, however, that ideas or culture are the only determinants of institutions, or that culture never changes.



Figure 1:

### Civil liberties in different cultural regions of the world



Sources: Freedom House (2013) and Licht et al. (2007)

Notes: The values are averages of the scores of those countries that belong to certain cultural regions. The index of civil liberties runs between 1 (the highest level) and 7 (the lowest level.)

Abbreviations: AF: African, EE: Eastern European, ES: English-speaking, FE: Far Eastern, LA: Latin American, ME: Mediterranean, WE: Western European

Changes seem to be less common in the case of civil liberties. Real significant changes have happened only in the African and Eastern European region. Even within Eastern Europe, however, it has been shown that culture is an important factor in shaping political institutions (Krasnozhan 2012, Winiecki 2004). In the case of economic freedom there seems to be more convergence between different regions, but the most spectacular catching-up can also be seen in the Eastern European cultural region.

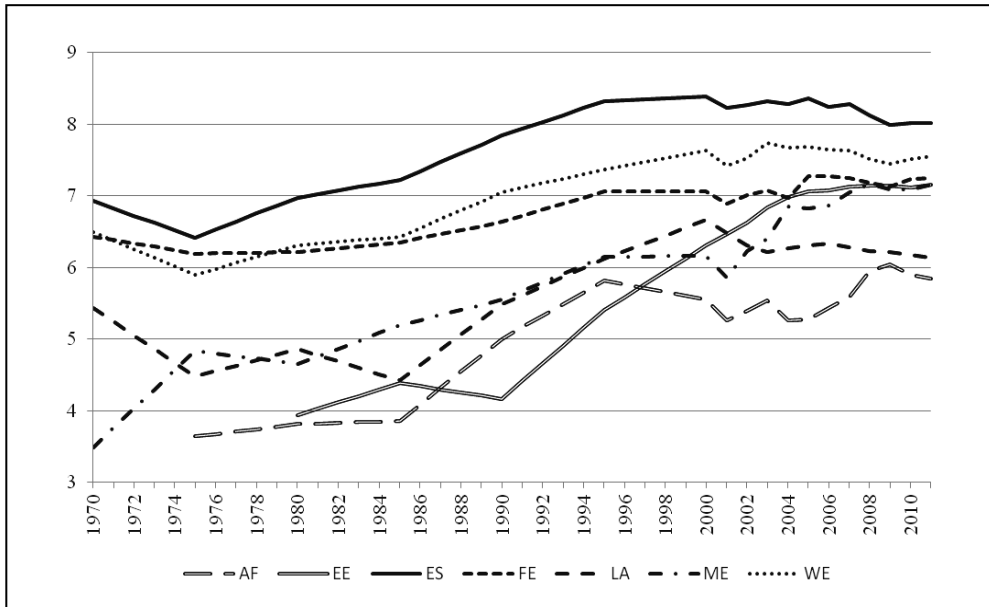
Tables 1-4 show a more systematic picture of whether there is a difference between the stickiness of civil liberties and economic freedom. Taking the indexes of these two kinds of freedom as dependent variables I use different dimensions of two measures of culture as independent ones: firstly that of Hofstede et al. (2010) and secondly that of Schwartz (2006, 2008) and Licht et al. (2007). Both cultural measures are widely used in cross-country regressions (see, for example, Gorodnichenko and Roland 2011, 2013).

Since I am only focusing here on the question of which kind of freedom is “explained” better by these cultural factors, I did not include any other explanatory variables. Tables 1 and 2 show the results with the Hofstede indexes as independent variables. There are two points worth making when looking at, and comparing, the results in Tables 1 and 2. First, not every dimension of culture has explanatory power: in the case of civil

liberties only two of them have, while in the case of economic freedom three of them do. The directions of the effect of power distance and individualism are the same in the sense that a lower level of power distance as well as a higher level of individualism is associated with a higher level of freedom. Uncertainty avoidance is, however, not significant at the ten percent level as a determinant of civil freedom, although it is a significant determinant of economic freedom, with a higher level of uncertainty avoidance being associated with a lower level of economic freedom (Table 1 column 5 as opposed to Table 2 column 5).

Figure 2:

### Economic freedom in different cultural regions of the world



Sources: Gwartney, Lawson and Hall (2013) and Licht et al. (2007)

Notes: The values are averages of the scores of those countries that belong to certain cultural regions. The index of economic freedom runs between 1 (the lowest level) and 10 (the highest level.)

Abbreviations: AF: African, EE: Eastern European, ES: English-speaking, FE: Far Eastern, LA: Latin American, ME: Mediterranean, WE: Western European

Second, the explanatory power of each cultural factor is greater in the case of civil liberties than in the case of economic freedom. This is shown by the fact that the r-squares are larger in Table 1 than in Table 2, meaning that larger shares of cross-country variance of civil liberties are "explained" by each cultural factor compared with the cross-country variance of economic freedom. Standardized beta coefficients are also larger in Table 1 than in Table 2, showing that a one-standard-deviation change in the same cultural factor is associated with a greater change in civil liberties than in economic freedom.

Comparing Table 3 with Table 4 leads to very similar conclusions. The directions of the factors are the same in Table 3 and 4; there is, however, one dimension, namely

harmony, that is negatively associated with civil liberties but is at the usual significance levels not associated with economic freedom. Looking at r-squares and standardized betas implies the same as above: cultural factors are better at predicting civil liberties than economic freedom.

Table 1:

**Cross-country regressions with Hofstede's cultural dimensions<sup>3</sup> as determinants of civil liberties**

	Dependent variable: average of civil liberties, 1975-2011			
constant	0.226 (0.74)	4.228 (14.33)***	2.323 (5.99)***	2.308 (3.66)***
power distance	0.0404 (7.21)***			
individualism		-0.037 (-7.91)***		
masculinity			0.005 (0.67)	
uncertainty avoidance				0.004 (0.46)
standardized beta coefficient	0.662	-0.660	0.074	0.066
R <sup>2</sup>	0.439	0.436	0.005	0.004
adj. R <sup>2</sup>	0.430	0.427	-0.011	-0.012
number of obs.	64	64	64	64

*T-statistics are in parentheses, standard errors are robust. Letters in the upper index refer to significance: \*\*\* : significance at 1 %, \*\* : significance at 5 %. T-values without an index mean that the coefficient is not significant even at the 10 % level.*

In spite of these facts, cultural factors are usually not incorporated explicitly into the explanation of civil liberties or political freedom. There are two main views on how democratic institutions develop (Paldam and Gundlach 2008) but neither of them see culture as a distinct factor in their explanations. The approach Paldam and Gundlach (2008) or Gundlach and Paldam (2009) refer to as critical junctures emphasizes the causality that runs from political institutions through economic institutions to development. This line of causality in itself does not exclude the role of culture as an explanatory factor but Acemoglu and Robinson (2012: 56-63), the main proponents of this view, do just this when accounting for economic development.

<sup>3</sup> Hofstede's four dimensions include the following. Power distance is the extent to which the less powerful members of organizations and institutions (like the family) accept and expect that power is distributed unequally. Uncertainty avoidance indicates to what extent a culture programs its members to feel either uncomfortable or comfortable in unstructured situations. Individualism is the extent to which individuals in the society are expected to look after themselves and their immediate families. Masculinity refers to the distribution of emotional roles between the genders.

Table 2:

**Cross-country regressions with Hofstede's cultural dimensions as determinants of economic freedom**

	Dependent variable: average of civil liberties, 1975-2011			
constant	7.365 (23.16)***	5.485 (21.72)	6.297 (27.18)***	7.488 (18.61)***
power distance	-0.018 (-3.39)***			
individualism		0.018 (4.20)***		
masculinity			0.000 (0.11)	
uncertainty avoidance				-0.017 (-3.26)***
standardized beta coefficient	-0.396	0.443	0.010	-0.405
R <sup>2</sup>	0.157	0.196	0.000	0.164
adj. R <sup>2</sup>	0.143	0.183	-0.016	0.150
number of obs.	64	64	64	64

*T-statistics are in parentheses, standard errors are robust. Letters in the upper index refer to significance: \*\*\* : significance at 1 %, \*\* : significance at 5 %. T-values without an index mean that the coefficient is not significant even at the 10 % level.*

There is more room for culture in the Grand Transition view or modernization thesis. But even in this theory, which is the opposite of the theory of critical junctures, this role is only implicit. The crucial factor here is either income or human capital (Barro 2012, Murtin and Wacziarg 2014, Paldam and Gundlach 2012). Although in his original article in this area of research, Lipset (1959:89, 96) mentions a "secular political culture" and "cosmopolitan" values as important factors for legitimate democratic institutions. The grand transition thesis is also echoed by those theories and empirical studies of economic development (Gleaser et al. 2004, Easterly and Levine 2012) that show that long-run economic development was determined to a large extent by human capital and probably culture, and not by the strategies of colonization (or the initial natural conditions by which it was affected) and by the different political institutions they resulted in, as is suggested by the first view.

When accounting for the democratization of Europe, Congleton (2011, 2013) incorporates the role of ideology (new normative theories) as one of the factors – together with technology – that changes the circumstance and bargaining power of different interest groups. What makes their thesis different from the Lipset hypothesis is twofold. On the one hand, Congleton's view of the causality is more nuanced than the roughly one-way causality explanation held by those supporting the Grand Transition view (Lipset hypothesis): his explanation involves a "bootstrapping" process between economic and political institutions, ideology, technology and development. On the other hand, his informal factors are not deep-seated culturally, rather they are "liberal theories" that emerged in the eighteenth century.

When Hillman and Ursprung (2000) address the puzzle of how liberalizing the political arena can lead to economic decline, they make some important points

concerning the role of culture. In their model, political culture is described by the government responsiveness to rent seeking. When political culture is worse in this sense, a liberalized political arena will lead to a higher level of rent seeking, and of taxation. That is, more political freedom leads to less economic freedom.

This paper tries to contribute to the understanding of the role of informal factors to the enhancing of civil liberties by developing an argument that is capable of explaining the stylized facts presented in this section. Section 3 will be devoted to this task.

*Table 3:*

**Cross-country regressions with Schwartz's cultural dimensions<sup>4</sup>**

	Dependent variable: average of civil liberties, 1975-2011		
constant	-7.238 (-6.73)***	9.163 (4.38)***	-2.113 (-3.78)***
embeddedness	2.577 (8.82)***		
harmony		-1.579 (-3.36)***	
hierarchy			2.055 (7.78)***
standardized beta coefficient	0.666	-0.441	0.748
R <sup>2</sup>	0.444	0.194	0.559
adj. R <sup>2</sup>	0.432	0.177	0.550
number of obs.	49	49	49

*T-statistics are in parentheses, standard errors are robust. Letters in the upper index refer to significance: \*\*\* : significance at 1 %, \*\* : significance at 5 %. T-values without an index mean that the coefficient is not significant even at the 10 % level.*

### 3. A simple theory of the provision of civil liberties

In the following I will develop a simple model of constitutional choice with a rent-seeking government. The model incorporates three fundamental assumptions (specific formalized assumptions set aside): (1) civil liberties and economic freedom measure different dimensions of freedom (not only a wider or narrower range of the same); (2) cultural factors determine the enforcement of the institutions of freedom; (3) different rights (within the bundle of rights provided by the government) generate different levels of material income, by which I mean income that can be expropriated

<sup>4</sup> Schwartz (2008: 8-10) differentiates between "three bipolar dimensions of culture": autonomy (affective and intellectual) versus embeddedness, egalitarianism versus hierarchy, and mastery versus harmony. I have used the second element of these pairs of values. "In cultures with emphasis on embeddedness", writes Schwartz (2008: 8-9), "people are viewed as entities in the collectivity. Meaning in life is expected to come largely through social relationships ... important values ... are social order, respect for tradition, security, and wisdom." Hierarchy, on the other hand, "defines the unequal distribution of power, roles, and resources as legitimate and even desirable. ... Values of social power, authority, humility, and wealth are highly important" (ibid: 9). Finally, harmony "emphasizes fitting into the social and natural world ... important values in harmony cultures include world at peace, unity with nature, and protecting the environment, and accepting one's portion" (ibid: 9)

by some form of rent seeking. In what follows I will first explain these assumptions (section 3.1) then formalize them into a simple model (section 3.2) that can explain why civil liberties are stickier than economic freedom (section 3.3).

Table 4:

**Cross-country regressions with Schwartz's cultural dimensions**

	Dependent variable: average of economic freedom, 1975-2011		
constant	11.28 (9.21)***	5.240 (2.74)***	8.000 (14.19)***
embeddedness	-1.297 (-3.84)***		
harmony		0.271 (0.63)	
hierarchy			-0.721 (-2.73)***
standardized beta coefficient	0.429	0.097	-0.336
R <sup>2</sup>	0.184	0.009	0.113
adj. R <sup>2</sup>	0.166	-0.012	0.094
number of obs.	49	49	49

*T-statistics are in parentheses, standard errors are robust. Letters in the upper index refer to significance: \*\*\* : significance at 1 %, \*\* : significance at 5 %. T-values without an index mean that the coefficient is not significant even at the 10 % level.*

### 3.1. Enforcement, culture, and expropriability<sup>5</sup>

*Is there a difference between “economic” and “non-economic” rights?*

Although it is usual to separate economic, civil, and political freedom, the notion of property rights as “...‘authority’ to select for specific goods, any use from a nonprohibited class of uses” (Alchian 1977[1965]: 130) leads to the conclusion that “[h]uman rights are simply part of people’s property rights” (Barzel 1989: 2., footnote 1).

Instead of viewing civil freedoms<sup>6</sup> and economic freedoms as separate we can differentiate between two dimensions of the constitutional decision on the freedom of the individual. Vanberg (2001: 23) proposes that these two dimensions are, on the one hand, what he calls “the issue of assigning rights” which answers the question “who owns what?” and the “issue of defining rights”, on the other, which answers the question of “what does it mean to own something?”.

<sup>5</sup> For a more detailed discussion of these assumptions see Czeglédi (2012, 2014).

<sup>6</sup> The works concentrating on the economic consequences of “non-economic” rights usually see “democracy” as a mix of different institutions providing political rights and civil liberties. These rights and liberties are theoretically different, but they are very closely associated empirically. However, my approach does not really apply to political rights, only to civil liberties. This is why I confine the discussion to civil liberties. The fact that these two sets of rights are conceptually different, too, is expressed, for example, in the views held by some great classical liberal thinkers who fully supported civil freedom but were not democrats at all (Director 1964: 3-4).

The first dimension can be seen as the scope of rights an individual is provided with, while the second is about the extent to which these rights of the individual are enforced. The index of civil liberties (Freedom House 2013) is a proxy of the first dimension, while the measures of economic freedom (Gwartney, Lawson, and Hall 2013, Miller, Holmes, and Feulner 2013) are proxies of the second.

### *Culture as a determinant of enforcement costs*

The idea of interpreting enforcement costs as a measure of “culture” is a direct consequence of the stickiness of institutions mentioned in section 2. Boettke (2012: 150-151) writes, for example that, “[i]n a world where the informal rules (norms) legitimate the formal rules, the costs of enforcement will be lower”. This is because, as Stringham (2011) explains carefully, external constraints without morals that back them are not enough to maintain a well-functioning market.<sup>7</sup>

Storr (2013) argues similarly, by saying that culture provides a system of meaning through which people understand institutions. Consequently, the incentive effect of the same institutions will be different.

This relationship between enforcement costs and the attitude toward market exchange can also be derived from Buchanan (1994) whose main point is that “[t]he ordering over goods cannot be separated from the means through which goods are expected to be secured” (ibid: 127). As a result, once rent seeking as a means is condemned to a larger extent than market exchange as a means, enforcing market rules will be less costly.

### *The expropriability of income of different rights is different*

If the non-prohibited class of uses defined by property rights is wider, the individual has more opportunities to generate income. To this I add the assumption that the incomes different rights generate will not be the same in terms of their expropriability, that is, they cannot be grabbed equally well by rent seeking.

The idea behind this assumption comes from BenYishay and Betancourt (2012) who propose that first generation human rights (civil liberties such as the freedom of expression) provide indirect benefits and generate rents that are more easily expropriable by politicians than the rent generated by second generation human rights.

This idea of BenYishay and Betancourt (2012) can be generalized by realizing that every right may have an instrumental and a direct role. First, “a right to perform a certain (physical) action” (Coase 1960: 44) can be seen as a factor of production. Secondly, such a right may have a value in itself originating from the freedom which it provides. The “income” in this case comes from the possibility to perform a certain

<sup>7</sup> The experimental evidence presented by Campos-Ortis et al. (2012) supports the notion that the attitudes towards cooperation and against rent seeking (theft) are different across countries and are related to economic performance. Campos-Ortis et al. (2012), for example, show that subjects in experiments are more cooperative and prefer production over theft and protection activities to a greater extent in countries in which there is a high level of generalized trust, and in which governance and formal institutions are of higher quality, and the feeling of a lack of safety is weaker.

action. The point is that this “income” cannot be expropriated because it is generated by the lack of expropriation in the first place.

The next two subsections will specify these three assumptions to argue that a decrease in enforcement costs will lead to a wider scope of rights, but not necessarily to a higher level of their enforcement.

### 3.2. Rent seeking and the enforcement of rights

Assume that there is a range of rights that can be provided to a producer. These rights can be ordered on a scale  $[0,1]$ . Producers use a right  $i \in [0,1]$  to generate income. Different rights provide different mixes of expropriable and non-expropriable income. When thinking about political decision making, in accordance with a rent-seeking view of government, it is only expropriable income that matters. Government decisions are supposed to be motivated by the possibilities of expropriating income. The potential expropriable income of a producer is assumed to be

$$Y = \int_0^s f(i, H) di = \int_0^s a(i) \delta H di = A(s) \delta H, \quad (1)$$

where  $\delta > 0$ ,  $1 \geq s > 0$  and  $a(i)$  is the expropriability function showing that part of the income  $\delta H$  which is expropriable through rent seeking.  $H$  is the amount of resources used in production, while  $s$  represents the border between non-prohibited and prohibited class of uses.

The function  $a(i)$  is assumed to be shaped by two broad factors. On the one hand, it is determined by the physical technology used by the producers. At a higher level of specialization the production process becomes more complex, more “institutions-intensive”<sup>8</sup>, making it more difficult for the government to expropriate the income that is generated by it. On the other hand,  $a(i)$  is shaped by the formal institutions that explicitly constrain expropriation.

The decision regarding the scope of rights is made by the rent seekers. As a result, the scale of rights  $[0,1]$  reflects a descending order of expropriability: the first right that is provided will be the one that can generate the highest level of expropriable income, and so on. This leads us to assume that

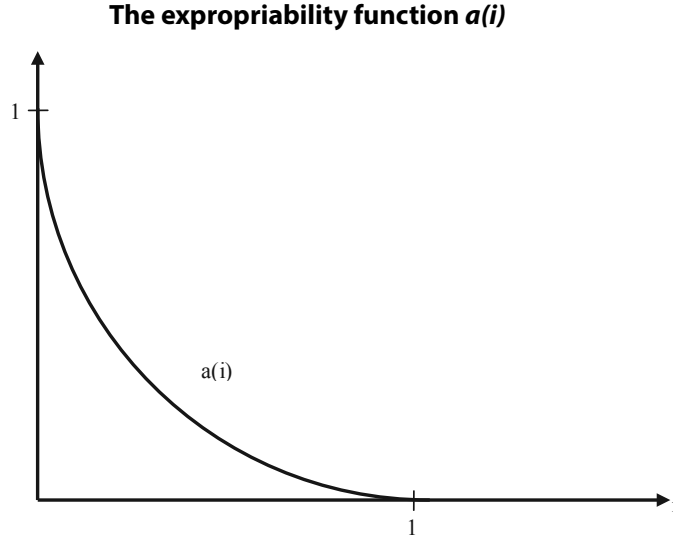
$$a(0) = 1, a(1) = 0, a_i(i) < 0, a_{ii}(i) > 0, \lim_{i \rightarrow 0} [a_i(i)] = -\infty, \lim_{i \rightarrow 1} [a_i(i)] = 0, \quad (2)$$

where lower indices denote the first and second derivatives of  $a(i)$ . The function  $a(i)$  is thus assumed to have the shape illustrated in Figure 1.

<sup>8</sup> This expression was used by Coase (2012) in a column and explained further by Kling (2013) in another column. As Kling (2013) writes, in an economy that is highly institutions-intensive “the concept of property has become more difficult to define, the economic entities have become more difficult to locate in time and place, the proportion of wealth that is intangible has risen, and earnings have become increasingly contingent on social constructs rather than on individual attributes”. In addition, in the dominant sectors of such an economy “the very definition of ‘output’ is not clear”.



Figure 1



The producers make the decision as to how much of their resources they will spend on enforcement as opposed to production<sup>9</sup>. Their resource constraints can be described as

$$H + s\theta gH = e \quad (3)$$

where  $e$  is the resource endowment of the producer, and  $g$  is the ratio of resources spent on the enforcement of right  $i$  to the resources used in production ( $H$ ). The parameter  $\theta$  describes the efficiency of enforcement: to reach a level of enforcement  $gH$ , the producer must give up  $\theta gH$  units of resources for each right that is provided to him.

The share of income that  $i$ s expropriated is determined by the relative enforcement level  $g$  and the number of rent seekers as compared to producers,  $r$ . The producer will receive a  $p(r, g)$  share of the income generated by right  $i$ , where

$$p(r, 0) = 0, p(0, g) = 1, p_r(r, g) < 0, p_g(r, g) > 0, \lim_{g \rightarrow \infty} [p_g(r, g)] = 0, \lim_{r \rightarrow \infty} [p_g(r, g)] = 0, \\ p_{gg}(r, g) < 0, \text{ and } p_{rr}(r, g) > 0. \quad (4)$$

<sup>9</sup> The resources spent on enforcement can be thought of as resources spent on containing public rent seeking. In the spirit of the economic theory of regulation (McChesney 1987) they can be thought of as payments made to avoid expropriation. There is equilibrium, then, between making a payment to prevent regulators from expropriating some income and letting them expropriate it. That is, as McChesney (1987) explains, there is equilibrium between rent extraction and rent creation. He points out (ibid: 108) that there is an "important similarity between capital expropriation in less developed countries and 'mere' regulation in developed nations... In both cases the very presence of a threatening government will reduce private investment". Indeed, as he concludes elsewhere (McChesney 2001: 380), "rent extraction represents a political strategy to extort private wealth". Besides, McChesney (2001) makes clear the difference between rent extraction and rent defending. At the level of simplicity of my model, however, these two cannot be separated.

Rent seekers and producers are supposed to look at each other with suspicion. This means that rent seekers (the government) assume(s) that the producers maximize the income the rent seekers do not expropriate, while the producers assume that the rent seekers maximize the income that they expropriate. That is, the producer chooses the level of  $g$  so as to maximize his or her non-expropriated income:

$$\text{Max}_g \left\{ \int_0^s p(r, g) a(i) \delta H(g) di \right\}, \text{ such that} \quad (5)$$

$$H(g) = \frac{e}{1 + s\theta g}.$$

Solving this problem gives the first order condition<sup>10</sup>

$$\frac{p_g(r^*, g^*)}{p(r^*, g^*)} + \frac{H_g(g^*)}{H(g^*)} = 0, \text{ or} \quad (6)$$

$$p_g(r^*, g^*) = p(r^*, g^*) (1 + s\theta g)^{-1} s\theta. \quad (7)$$

The market for rents is cleared. That is, in equilibrium, the income of a rent seeker must be equal to the income of the producer:

$$p(r^*, g^*)Y = \frac{1}{r^*} [1 - p(r^*, g^*)]Y \quad (8)$$

which is the same as

$$p(r^*, g^*) = \frac{1}{r^* + 1}. \quad (9)$$

The decision on the scope of rights is made by the producer with the prediction in mind concerning rent-seeking as above. That means that the producer will set  $s$  in order to maximize the non-expropriated income:

$$\text{Max}_s \{ p(r^*(s), g^*(s)) A(s) \delta H^*[s^*, g^*(s)] \}. \quad (10)$$

Assuming that there is an  $0 < s^* < 1$  that solves this problem,  $s^*$  satisfies

$$\left\{ \frac{p_g[r^*(s^*), g^*(s^*)]}{p[r^*(s^*), g^*(s^*)]} + \frac{H_g[s^*, g^*(s^*)]}{H[s^*, g^*(s^*)]} \right\} g_s^*(s) + \frac{p_r[r^*(s^*), g^*(s^*)]}{p[r^*(s^*), g^*(s^*)]} r_s^*(s) + \frac{H_s[s^*, g^*(s^*)]}{H[s^*, g^*(s^*)]} + \frac{A_s(s^*)}{A(s^*)} = 0. \quad (11)$$

<sup>10</sup> In the Appendix it is shown that the second order conditions hold, too.

The first term on the left-hand side of (11) must be zero because of (6). By noting that  $A_s(s^*) = a(s^*)$  because of (1), the condition above breaks down to

$$B(s^*) \equiv \frac{a(s^*)}{A(s^*)} = -\frac{p_r[r^*(s^*), g^*(s^*)]}{p[r^*(s^*), g^*(s^*)]} r_s^*(s^*) - \frac{H_s[s^*, g^*(s^*)]}{H[s^*, g^*(s^*)]} \equiv C(s^*). \quad (12)$$

The left-hand side of equation (12) can be seen as the marginal benefit of increasing the scope of rights that derives from the higher income that is generated by being able to exercise a wider scope of rights. The right-hand side is the marginal cost of increasing the scope of rights. First, a larger scope of rights will reduce expropriable income by increasing the number of rent-seekers because an increase in the number of rent seekers will reduce the share of income the producers receive. Second, as a result of a higher number of rent seekers the producer will spend more resources on enforcement and, as a result, less resources on production.<sup>11</sup>

To make the solution of (7), (9) and (12) possible, following Grossman and Kim (2000: 177) and Grossman (2002: 36) suppose that

$$p(r, g) = \frac{g}{r + g}. \quad (13)$$

Using this specific rent seeking technology, the conditions regarding the producer's problem (equations (7) and (9)) becomes

$$\frac{r^*}{(r^* + g^*)^2} = \frac{g^*}{r^* + g^*} (1 + s\theta g^*)^{-1} s\theta, \quad (14)$$

$$\frac{g^*}{r^* + g^*} = \frac{1}{r^* + 1}. \quad (15)$$

Solving these for  $g^*$  and  $r^*$  gives

$$g^*(s) = 1, \quad (16)$$

and

$$r^*(s) = \theta s. \quad (17)$$

Knowing these best reply functions the (rent seeking) government will set the scope of rights so as to satisfy the condition (12):

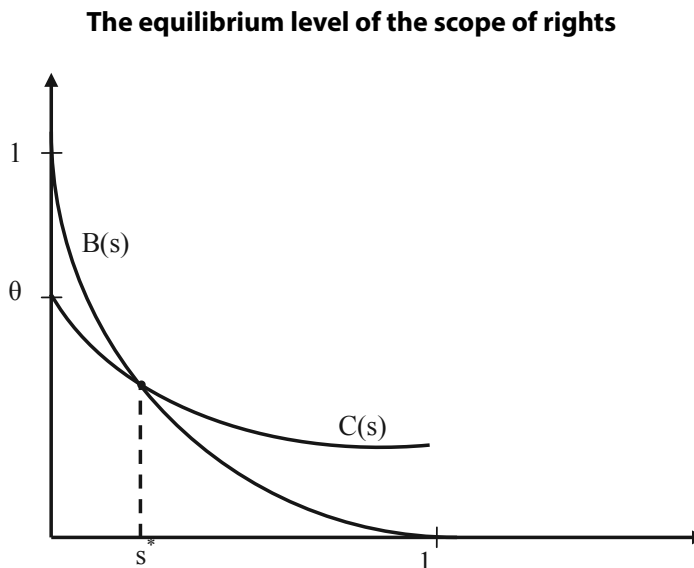
$$B(s^*) \equiv \frac{a(s^*)}{A(s^*)} = \frac{2\theta}{1 + \theta s^*} \equiv C(s^*). \quad (18)$$

<sup>11</sup> There is a third and a fourth effect, too. The producer will change the amount of resources spent on the enforcement of a certain right (effect 3) which also results in a change in the amount of productive resources (effect 4). The sum of these two effects on expropriable income is zero, however, as shown by equation (6).

It can be shown that  $B_s(s) < 0$  and  $B_{ss}(s) > 0$ . Assuming that  $\theta < 1/2$  and that  $B_{ss}(s) > C_s(s)$  there is one  $0 \leq s^* \leq 1$  that satisfies the necessary condition of (12)<sup>12</sup>. This equilibrium is illustrated in Figure 2.

The model just described may be seen as a simple model of a constitutional exchange (Congleton 2013) in which producers and rent seekers are the two parties. Rent seekers will provide a larger scope of rights when it pays off; that is, when total rent is increased by this decision. This happens if producers use the new rights provided to them to increase production by more than the loss resulting from an increasing level of rent seeking ( $r(s)$ ). In equilibrium these two effects are equal on the margin.

Figure 2:



### 3.3. Economic freedom versus civil liberty as enforcement level versus the scope of rights

The equilibrium derived above and illustrated by Figure 2 implies that the equilibrium level of the scope of rights will be changed by culture ( $\theta$ ) as well as by technology (shape of  $a(i)$ ). Below I will show that the model predictions are in line with the facts that were presented in section 2: a change in culture will have a greater effect on the scope of rights (seen as a proxy of civil liberties) than on the level of enforcement (seen as the proxy of economic freedom). On the other hand, a change in technology that increases the scope of rights will not necessarily increase the level of enforcement – another reason why the two freedoms may sometimes not go in step.

To see, first, how a cultural change will affect the scope of rights, consider that a totally differentiating equation (18) with respect to  $s^*$  leads to the result that

<sup>12</sup> See the Appendix.

$$\frac{ds^*}{d\theta} = \frac{C_\theta(s^*)}{B_s(s^*) - C_s(s^*)} < 0 \quad (19)$$

because

$$C_\theta(s^*) = \frac{2}{(1 + \theta s^*)^2} > 0, \text{ and} \quad (20a)$$

$$B_s(s^*) - C_s(s^*) < 0. \quad (20b)$$

That is, a change through which market rules becomes enforceable more easily (a decrease in  $\theta$ ) will increase the scope of rights.

The implication for the enforcement level is not that straightforward. First, note that the level of enforcement of rights in the model is represented by the function  $p(r, g)$ . To see how this will change as a reaction to changing cultural parameters, consider that

$$\frac{d[p(r^*(s^*), g^*(s^*))]}{d\theta} = \frac{d}{d\theta} \frac{1}{s^*\theta + 1} = -\frac{1}{(s^*\theta + 1)^2} \left[ s^* + \frac{ds^*}{d\theta} \theta \right]. \quad (21)$$

Consequently, a decrease in  $\theta$  will increase the level of enforcement if

$$\frac{ds^*}{d\theta} > -\frac{s^*}{\theta} \quad (22)$$

That is, if (22) does not hold, a “better” culture will result in more civil liberties and less economic freedom. If (22) holds, a “better” culture will result in more civil liberties and more economic freedom.

In addition, it can be shown that when technology changes in a certain way, the scope of rights will be larger, but the enforcement level will decrease. This kind of technological change can be called rights-biased. Imagine that the technology is improved so that exercising a right will lead to a higher income. At the same time the expropriability of rights is reduced so that

$$\frac{a^1(i)}{a^2(i)} > \frac{a^1(j)}{a^2(j)}, \quad i > j \quad (23)$$

when the expropriability function reduces to  $a^2(i)$  from  $a^1(i)$ . As illustrated in Figure 3, this means a disproportionately larger decrease in expropriability at the level of “lower order” rights. This means that the different rights become more similar in terms of the expropriability of income they generate.

Such a change in expropriability will increase the benefit of an increasing scope of rights from the point of view of the rent seeking government. That is because we know that

$$B^k(s) = \left[ \frac{A^k(s)}{a^k(s)} \right]^{-1} = \left[ \frac{1}{a^k(s)} \int_0^s a^k(i) di \right]^{-1} = \left[ \int_0^s \frac{a^k(i)}{a^k(s)} di \right]^{-1}, \quad k = 1, 2, \quad (24)$$

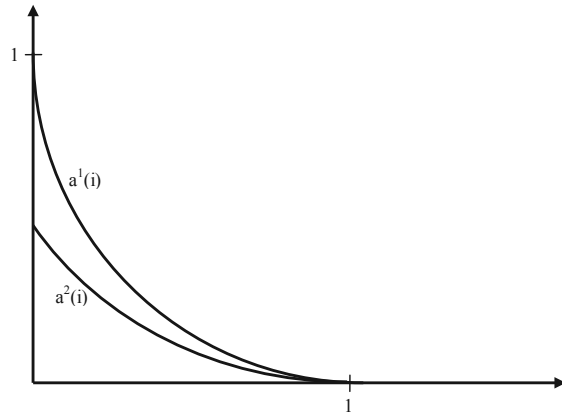
and that  $\frac{a^1(i)}{a^1(s)} > \frac{a^2(i)}{a^2(s)}$  if  $s > i$  which implies that  $B^1(s) < B^2(s)$ .

<sup>13</sup> See the Appendix for a proof that this holds.

As shown in Figure 4 such a change in expropriability will increase the scope of rights. In addition, if the improvement in technology ( $\delta$ ) is large enough, it will also increase total income.

Figure 3:

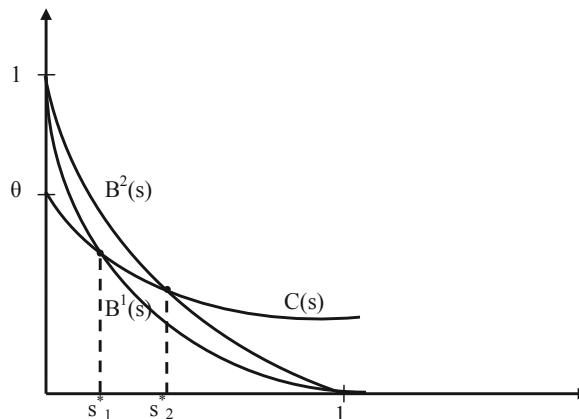
**The effect of a decrease of expropriability on  $a(i)$**



To sum up, the model predicts that there are two crucial factors to explain why some countries have more civil liberties (understood as a wider scope of rights): a culture that is more anti-rent seeking and a technology that is more rights-biased. A more benign attitude towards the market and a harder-to-expropriate nature of income will provide incentives to the rent-seeking government to provide a higher scope of rights. Oddly enough, these changes in the informal factors will not in every case result in an improvement of enforcement. It is because when a less costly enforcement of rights makes it possible to enforce a wider scope of rights, it will generate more income and attract more rent-seeking, which then reduces the security of these rights.

Figure 4:

**The effect of a decrease of expropriability on the equilibrium scope of rights**



## 4. Conclusion

Historical examples show that economic freedom and civil liberties do not necessarily go in step. Economic reforms that enhance economic freedom do not always enhance civil liberties at the same time, or do so only with a considerable delay. On the other hand, widening the scope of civil liberties may lead to a lower level of economic freedom by, for example, increasing government spending and taxation. This paper has developed a very simple model to understand why the determining factors of these two types of freedoms may be different by focusing on one aspect: common indexes of culture do a much better job of explaining civil liberties in a cross-country session than they do of explaining economic freedom.

The main proposition of the paper is, after all, a generalization and an application of the idea that “in a political world without transaction costs, there would be no regulation” (McChesney 1991: 82). It is a generalization because the question does not concern one industry but the whole of society. It is an application because I specified the transaction costs. First, political transaction costs were assumed away so that I can focus on the claim that attitudes to *market* transactions can account for the stickiness of institutions associated with civil freedoms. Second, I maintained that these transaction costs are determined by the attitudes people have towards the market as a means of organizing the allocation and production of goods.

In addition to the conclusion regarding the relation of informal factors to economic and civil liberties there is one further conclusion of the model that seems to be worth testing. The model predicts that the correlation between civil liberties and economic freedom is stronger when the wider scope of rights is enhanced by a more market-loving culture and not by a more rights-biased technology. As we saw, when informal factors improve, the level of enforcement will improve, too, under certain conditions, while in the case of technology becoming more rights-biased, the enforcement level will, if anything, worsen. Developing empirical tests to check this prediction is a task for further research.

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## Appendix

**Proposition** The second order condition of problem (5) holds in equilibrium

*Proof:*

The second order condition of problem (5) is

$$p_{gg}(r^*, g^*)H(g^*) + 2p_g(r^*, g^*)H_g(g^*) + p(r^*, g^*)H_{gg}(g^*) < 0. \quad (25)$$

First, consider that because of equation (3)

$$H_g(g^*) = -\frac{es\theta}{(1+s\theta g^*)^2} \text{ and } H_{gg}(g^*) = \frac{2e(s\theta)^2}{(1+s\theta g^*)^3} \quad (26)$$

and according to equation (7)

$$p_g(r^*, g^*) = p(r^*, g^*) \frac{s\theta}{1+s\theta g^*}. \quad (27)$$

Using equations (26) and (27), the left-hand side of inequality (25) becomes

$$\begin{aligned} & p_{gg}(r^*, g^*)H(g^*) + 2p_g(r^*, g^*) \frac{s\theta}{1+s\theta g^*} \left( -\frac{e}{1+s\theta g^*} \right) + p(r^*, g^*) \frac{2e(s\theta)^2}{(1+s\theta g^*)^3} = \\ & = p_{gg}(r^*, g^*)H(g^*) - 2p(r^*, g^*) \frac{es\theta}{(1+s\theta g^*)^2} \left( 1 - \frac{s\theta}{1+s\theta g^*} \right) \end{aligned}$$

which is negative if  $s\theta < 1$  because the assumptions made in (4).

With the specific assumptions in (13) and with the equilibrium values,  $g^* = 1$ ,  $r^* = \theta s$  which that assumption implies, the right hand side of inequality (25) becomes

$$\frac{-2r^*}{(r^* + g^*)^3} \frac{e}{1+s\theta g^*} + \frac{2r^*}{(r^* + g^*)^2} \frac{-es\theta}{(1+s\theta g^*)^2} + \frac{2g^*}{r^* + g^*} \frac{-e(s\theta)^2}{(1+s\theta g^*)^3} = -\frac{2es\theta}{(1+s\theta)^4}$$

which is negative because  $e$ ,  $s$ , and  $\theta$  are all positive by assumption. ■

**Proposition**  $B_s(s) < 0$  and  $B_{ss}(s) > 0$  where  $B(s)$  is defined as in equation (12).

*Proof*

$$B_s(s) = \frac{a_s(s)A(s) - a_s(s)A_s(s)}{[A(s)]^2} = \frac{a_s(s)}{A(s)} - [B(s)]^2 < 0.$$

$$B_{ss}(s) = \frac{a_{ss}(s)}{A(s)} - \frac{a_s(s)}{A(s)} B(s) - 2B(s)B_s(s) = \frac{a_{ss}(s)}{A(s)} - B(s) \left[ \frac{a_s(s)}{A(s)} + 2B_s(s) \right] > 0. \quad \blacksquare$$

**Proposition** There exists an  $0 < s^* < 1$  that satisfies the conditions

(1)  $B(s^*) = C(s^*)$ , and

(2)  $B_s(s^*) - C_s(s^*) < 0$ ,

where  $B(s^*)$  and  $C(s^*)$  are as defined in equation (12) in the text.

*Proof* that condition (1) holds:

Define  $D(s) = B(s) - C(s)$ . Using equation (18) it is clear that  $B(0) = 1$ ,  $B(1) = 0$ ,  $C(0) = 2\theta$ , and

$$C(1) = \frac{2\theta}{1+\theta}.$$

According to the intermediate value theorem there must be an  $s \in [0, 1]$  such that  $D(s) = 0$ ,

$$\text{since } D(0) = B(0) - C(0) = 1 - 2\theta > 0 \text{ if } \theta < 1/2 \text{ and } D(1) = B(1) - C(1) = 0 - \frac{2\theta}{1+\theta} < 0 \blacksquare$$

*Proof* that condition (2) holds:

Because

$$B_s(0) - C_s(0) = -\infty + 2\theta^2 < 0,$$

$$B_s(1) - C_s(1) = 0 + \frac{2\theta^2}{(1+\theta)^2} > 0,$$

and it is supposed that

$$B_{ss}(s) > C_{ss}(s) > 0,$$

there is an  $s'$  such that  $B_s(s) - C_s(s) < 0$  if  $s < s'$  and  $B_s(s) - C_s(s) \geq 0$  if  $s \geq s'$ .

To see that condition (2) holds, consider that  $s^*$  must be larger than  $s'$  which can be shown as follows.

Assume that  $s^* \geq s'$ . This implies that  $B_s(s^*) - C_s(s^*) \geq 0$  and  $B_s(s) - C_s(s) \geq 0$  if  $s \geq s^*$ . As

$$\text{a result } \int_{s^*}^1 B_s(s) ds \geq \int_{s^*}^1 C_s(s) ds \text{ or } B(1) - B(s^*) \geq C(1) - C(s^*) \text{ and hence } B(1) \geq C(1). \text{ This is}$$

impossible by definition.

Since we have shown that it is impossible to have  $s^* \geq s'$  what we must have is an  $s' > s^*$  meaning that  $B_s(s^*) - C_s(s^*) < 0$ . ■

Judit Kapás

## Unbundling Culture: The Impact of Individual Values on Development\*

### Introduction

Although Adam Smith (1759) was the first to analyze how norms, beliefs, morality and culture affect economic development, an upsurge of the interest in the role of culture has occurred only recently. This new branch of research has been developing within institutional economics. The view that “institutions matter” has been given strong theoretical foundations and acquired plentiful empirical evidence over the last couple of decades. The expression “institutions matter” refers, however, to the impact of *formal* institutions (in the sense of North 1990) on development. Nowadays, with the above-mentioned new branch of research a new expression is emerging: “culture matters”, meaning that culture has been recognized as a crucial determinant in economic development. So, in the past decade, besides *formal* institutions, scholars have also started to devote more attention to the role of *informal* institutions, i.e., culture.

In this area, a growing number of studies have provided us with empirical evidence on the positive effect of culture on economic performance<sup>1</sup> (Guiso et al. 2006, Tabellini 2008, 2010, Stulz and Williamson 2003, Gorodnichenko and Roland 2011). This evidence shows, in some cases, the overwhelming effect of culture vis-à-vis that of formal institutions (e.g., Williamson 2009). In these investigations, culture is generally measured by the subjective evaluation of those answering the question “Do you think that most people can be trusted?” in the World Values Survey (WVS).

However, whether an answer to this question really refers to culture has recently been doubted by a growing number of scholars, a problem which goes back to a somewhat ambiguous concept of culture. Another problematic issue here is that these empirical investigations do not rely on any specific economic theory concerning

\* This research was supported by the Hungarian Scientific Research Fund (contract no: 84030).

<sup>1</sup> In economics, while the majority of research on the impact of culture is empirical, a few studies, such as Landes (2000), Sen (2002) or Boettke (2001), have argued for a more narrative approach, showing an enthusiasm for the idea that “culture matters”: “If we learn anything from the history of economic development, it is that culture makes almost all the difference. (Here Max Weber was right on.)” (Landes 2000:2).

the effects of culture on economic performance, at least not when it comes to the mechanisms through which culture may effect development.

One way to overcome these shortcomings – more importantly the “black box” view of culture, as Tabellini (2010) has also argued – is to move from general statements about culture (which is the predominant approach in the literature) to a narrower, and consequently more reliable, dimension of culture. My argument is that Schwartz’s (2006) theory of cultural value orientations developed in cross-cultural psychology can be fruitfully used, for two reasons. First, this theory relies on *a priori* theorizing about three basic issues that all societies confront – from which individual values stem – rather than *post hoc* examination of data. Secondly, it captures only one, but an unambiguous, aspect of culture: individual values.

So, in this paper I will argue that an analysis of the role of individual values in economic development contributes to a clarification of the effects of culture by “unbundling” culture itself. Using individual values allows me to rely on theories of institutional economics – namely Williamson’s (2000) theory about the levels of institutions and Boettke et al.’s (2008) theory on institutional stickiness – to make hypotheses about their effects on development, and then empirically investigate them.

On the basis of these theories, the main argument will be that individual values, being core informal institutions, are *fully* embodied and crystallized in the stickiest formal institutions of a society, such as the rule of law or the security of property rights, which have evolved over time in a spontaneous, endogenous process. Accordingly, individual values do not stand alone in themselves in the sense that they have an effect on development beyond that of the above-mentioned formal institutions. Indeed, just the opposite is true: the impact of values is felt fully through these endogenous formal institutions. In other words, the stickiest formal institutions (e.g., the rule of law) institutionalize values as core informal institutions. When moving towards less sticky formal institutions, that is, exogenously designed ones, the effect of values will be different: they are expected to affect development after controlling for exogenous formal institutions.

When it comes to cross-country empirical investigation, I will use the Schwartz Values Survey data on individual values, and for the sake of comparison, the culture index derived from the WVS developed by Williamson and Mathers (2011), too. The results provide evidence for my hypotheses and are robust, and the effect of individual values is different from that of the culture index.

At the end of the day, my argument in this paper is that (the core of) culture, i.e., individual values matter for development, but their kind of effect depends on the stickiness of the formal institutions.

The paper is organized as follows. In section 2 I will briefly review the empirical literature on the impact of culture on development, by also making also clear what concept of culture lies behind the various approaches. In section 3 I will argue for an “unbundling” of culture by relying on the concept of culture as individual values. In section 4 I will set out my main hypotheses about the effect of individual values on development by relying on two theories of institutional economics. In section 5 I will present the empirical investigations. The last section will conclude.

## Review of the literature

Despite the increasing interest in economics in the role of culture, the concept of culture in economics is somewhat vague. What seems to be crystallized as a view towards which concepts are converging is the view of culture as social conventions and norms that sustain equilibria. This concept finds its roots in North's (1990) theory about informal institutions. Even North (1990:36) himself views culture as the informal constraints that guide humans' daily interactions. In the same manner, Guiso et al. (2006:23) defines culture as "...those customary beliefs and values that ethnic, religious, and social groups transmit fairly unchanged from generation to generation." Guiso et al. (2008) builds a model in which culture refers to beliefs about the consequences of one's actions, where such beliefs are purposefully manipulated by earlier generations or by deliberate experimentation. Greif (1994) sees culture as Nash equilibria in repeated social interactions or as focal points when there are multiple equilibria.

Clearly, all these concepts of culture center on beliefs, norms, conventions, i.e., informal institutions.<sup>2</sup> When it comes to empirical analysis, the question is how to measure these beliefs, norms, conventions. Scholars basically use two different types of measures. One is when culture is proxied by religiosity; the other is when a measure of trust, social capital, morality, etc. is used as a proxy. Here of course the next problematic issue is to find a proxy for trust, social capital, etc.

The literature in which religiosity is used to express culture dates back at least to the work of Max Weber (1930). In his influential work, Weber argues that Protestantism played a crucial role in the development of capitalism and its institutions: the Protestant Reformation taught that the pursuit of wealth should be regarded as an advantage and, at the same time, a duty.

More recent papers include Barro and McCleary (2003), which examines the impact of church attendance and religious beliefs on economic growth. In their panel regression they use WVS data as well as two other reports on religion to measure church attendance and religious beliefs. Empirical evidence is provided for their assumption, namely that religious beliefs influence individual traits that enhance economic performance: they find that economic growth is positively related to the extent of religious belief, notably a belief in heaven and hell, but negatively to church attendance. To deal with the potential problem of endogeneity, they also use instrumental variables (dummy variables for the presence of state religion and for regulation of the religion market, an indicator of religious pluralism, and the composition of religions).

Knack and Keefer (1997) focuses on the role of social capital and find empirical evidence that it matters for economic performance. As proxies for social capital this paper uses *trust* and *civic norms* from WVS. The authors find that both *trust* and *civic norms* are stronger in countries with higher and more equal incomes, with institutions

<sup>2</sup> Hofstede's concept of culture as the "software of the mind" or "the collective level of mental programming" (Hofstede 1996) is in line with this definition. Evolutionary perspectives are also in the same spirit, such as that of Boyd and Richerson (1985) who define culture as "transmission from one generation to the next, via teaching and imitation, of knowledge, values, and other factors that influence behavior (ibid p. 2)".

that restrain predatory actions of chief executives, and with better-educated and ethnically homogeneous populations.

Guiso et al. (2006) investigates the impact of culture on certain economic outcomes such as the probability of becoming entrepreneurs, or national savings, or state efforts on income redistribution. They assume that culture as defined by religion and ethnicity affects beliefs and trust, and in their cross-country regressions they are able to show that beliefs have an impact on the above outcomes. They use data from WVS, but they interpret *trust* differently and do not equate it with culture, which means their paper diverges from those that follow Tabellini (2008).

That line of research which proxies culture by trust is, to a significant extent, influenced by Tabellini (2008). He pioneered the use of such variables as *trust*, *respect*, *control* and *obedience*, based on the answers to four questions from the WVS. He uses these variables in a number of papers to analyze the effect of culture on various institutions and economic development.

In his 2010 paper (Tabellini 2010) he shows that the aggregate variable constructed from the four above significantly correlates with current development, after controlling for country fixed effects and for school enrollment in 1960. He assumes that *trust*, *respect* and *control* serve as rules governing and stimulating interaction between individuals, whereas *obedience* is thought to limit economic interaction and development by decreasing risk-taking, which is important for entrepreneurship.

He also uses an instrumental variable estimation because of his suspicion the causal effect of culture is endogenous to economic development. His finding is that the data do not reject the hypothesis that the effect of the two historical variables (past literacy and past political institutions) on regional output only operates through culture. When it comes to the question of whether the effect of culture is direct or indirect, his results suggest that the effect of culture on output mainly or exclusively operates through the functioning of government institutions, at least within Italy. A plausible interpretation of the findings of this paper is that cultural differences are so important because they bring about a different functioning of the same formal institutions, and that culture is central to the mechanism through which past institutions influence the functioning of current institutions.

The four measures suggested by Tabellini are extensively used by Williamson in several empirical studies. In her 2009 paper (Williamson 2009) she investigates the relationship between formal and informal institutions (culture) and how the interaction between the two can impact development. To measure formal institutions, she used the political institutions of Glaeser et al. (2004) and develops an index for formal institutions by using the first principle component of four measures. In order to measure informal institutions (culture), she relies on Tabellini (2008). She develops a culture index based on the four variables described above. Then she calculates the difference between the formal and informal (culture) indices with the aim of measuring the strength of formal institutions vis-à-vis the informal ones. Her results, in an important respect, are different from those of Tabellini because she identifies a dominant effect of informal institutions (culture): strong informal institutions are determinants of economic development regardless of the strength of the formal institutions. A further message of her results is that formal institutions are only beneficial in the presence of particular informal institutions (culture).

More recently, she and her co-author (Williamson and Mathers 2011) show that culture, and the economic institutions associated with economic freedom are both independently important for economic growth, where culture is measured by the above-mentioned culture index (from Williamson and Kerekes 2009). They find that when controlling for both culture and economic freedom simultaneously, the strong association between culture and growth becomes much weaker, while, overwhelmingly, economic freedom retains a positive and highly significant relationship with economic growth. According to them, this suggests that culture and economic freedom may act as substitutes. To some extent this result conflicts with that of Williamson (2009) since here culture becomes less in the growth regression when certain institutions are in place.

Mathers and Williamson (2011) is another paper which investigates how the interaction between culture and economic freedom affects economic prosperity. By including culture in the analysis the authors aim to provide a partial explanation for why the same institutions lead to different economic outcomes. They find that culture enhances the impact of economic freedom on growth by about 10 percentage points. Their results suggest that the same economic institutions combined with different cultures have diverse outcomes.

Besides Tabellini's measures derived from WVS, some other measures are also used in the literature. For instance, Voigt and Park (2008), as proxies for values and norms (culture) use the GLOBE<sup>3</sup> (Global Leadership and Organizational Behavior Effectiveness Research Program) study on culture, leadership and organization, in which different values and norms reflect firm behavior, in particular different leadership models. Voigt and Park (2008) is interested in culture's effect on long-run development. Their hypothesis is that in the long-run there would be a close correspondence between culture (values and norms) and institutions, since those institutions which are incompatible with the prevalent values and norms are likely to disappear. They use a simultaneous equation approach and examine the influence of culture both directly and indirectly via institutions such as rule of law, constitutionalized democracy, constraints on the executive and civil society proxied by the number of international non-governmental organizations active in a given country. As for the direct effect of culture, their results are rather mixed: when using the rule of law as a measure for institutions, culture does not have a significant effect beyond that of the rule of law; when using a measure of political institutions, some values have a significant effect. As for the indirect effect of culture, the results are not convincing either way. In sum, Voigt and Park (2008) find that some norms matter for economic development, but this impact greatly depends on the choice of institutional proxy.

Gorodnichenko and Roland (2010, 2011) analyze the effect of the three main measures of culture (WVS, Hofstede data and Schwartz Values Survey) on output per capita. In the 2011 paper they find that the Hofstede's individualism index is always significant, whereas this is not the case for most cultural variables. Among the Schwartz variables<sup>4</sup>, *embeddedness* is significant with a negative effect, and *affective autonomy*, *intellectual autonomy*, and *egalitarianism* are also jointly positively significant.

<sup>3</sup> Available at: <http://www.ccl.org/leadership/pdf/assessments/GlobeStudy.pdf>

<sup>4</sup> The Schwartz variables will be presented in detail in the next section.



In their more detailed analysis (Gorodnichenko and Roland 2010), they assume that culture plays a key role in stimulating innovations and hence explaining long-run economic growth. They hypothesize that culture is a basic force underlying formal institutions and long-run growth. They find that there is a two-way causality between culture and institutions, thus suggesting that institutions are in part determined by culture. They show empirically a strong causal effect from culture to long-run growth and the level of innovation. Their findings are consistent with the predictions of their theory, indicating that a more individualist culture should lead to more innovation and hence greater economic development. They clearly show that culture makes an important contribution to economic development which is independent of institutions. In terms of magnitudes, culture explains income differences across countries at least as much as institutions. However, they also show that culture itself might have an important effect on the choice of political and legal institutions.

In some sense Hansen (2013) provides evidence for Gorodnichenko and Roland (2011) by showing that US immigrants from cultures that are oriented toward more individualistic values have higher annual earnings. He shows that culture accounts for about 20% of the country-level correlation between individualism and income.

Dobler (2011) also shows the significant effect of culture on economic growth by using the same variables derived from WWS as Tabellini. Specifically, she focuses on the transmission channels between formal and informal institutions. She uses religious variables as instruments for formal and informal institutions.

Johnson and Lenartowicz (1998) also analyzes the effect of culture on growth, primarily via establishing the relationship between cultural values and economic freedom. According to their results, *autonomy* is positively associated with economic freedom, while *hierarchy* and *conservatism* are negatively associated.

### **Individual values: towards unbundling culture**

Based on the above review, a brief summary of the literature is that “culture matters” for economic development, and what is more, the empirical evidence shows, in some cases, the overwhelming effect of culture vis-à-vis that of formal institutions (e.g., Williamson 2009). This literature has been developing since the mid-1990s, and is clearly in its infancy. Criticism has begun to emerge over the past few years.

Interestingly, an important criticism regarding the vague concept of culture itself comes from one of the most prominent scholars in the field, namely Tabellini. According to him (Tabellini 2010:711), culture is a black box in the literature. Hermann-Pillath (2014) is even more critical vis-à-vis the recent economic work on culture when arguing that the inclusion of culture in economics lacks a theoretical foundation: “economics of culture without a theory of economics” (ibid p. 320). In his opinion the econometrics of culture just shows that there is an impact of *something* on economic performance. Furthermore, if one identifies trust or religion as a significant variable in explaining development, one does not *explain* why trust or religion is important, and how they work. Guiso et al. (2006) also argues for theory-based testable hypotheses when analyzing the role of culture.

Thus, the concept of culture is not clear, and what is used in regressions is an amalgam of institutions, values and social structures that leads to development. One way to overcome the “black box” view of culture is to move from general statements about culture (which is the predominant approach in the literature) to a narrower, and consequently more reliable (core) dimension of culture.<sup>5</sup> My argument is that Schwartz’s (2006) theory of cultural value orientations developed in cross-cultural psychology can be fruitfully used for three reasons. First, this theory relies on *a priori* theorizing about three basic issues that all societies confront, rather than *post hoc* examination of data. Secondly, it captures only one, but an unambiguous, (core) aspect of culture: individual values. Another advantage of using individual values in terms of culture is that one does not need to assign a functional role to it.

In this spirit I will try to unbundle culture when thinking of culture in terms of individual values as its core constituent part. My intention here seems to be supported by the interpretation of culture emerging in psychology, in which culture refers to more primitive objects, such as individual values (e.g., Akerlof and Kranton 2000). This view has recently appeared in economics as well: Alesina and Guiliano (2014) argue that “the concept of culture as moral principles, rules of thumb or normative values that motivate individuals is particularly appealing” (ibid p. 185).

When it comes to individual values, a current, very influential theory of culture, the so-called theory of cultural value orientations, comes from cross-cultural psychology and has been developed in numerous papers and book chapters by Schwartz (e.g., Schwartz 1992, 1994, 1999, 2006, 2009, 2014).

Schwartz (2006) sees culture as the rich complex of meanings, beliefs, practices, symbols, norms, and values prevalent among people in a society. According to him, the prevailing value emphases in a society are the most central feature of culture. So, he (Schwartz 1999) defines values as “conceptions of the desirable that guide the way social actors (e.g., organisational leaders, policy-makers, individual persons) select actions, evaluate people and events, and explain their actions and evaluations” (Schwartz 1999:24). That is, as he argues, cultural values represent the implicitly or explicitly shared abstract ideas about what is good, right, and desirable in a society, and they are the bases for the norms that guide people in various situations.

The major advantage of using Schwartz’s theory of cultural values is that it is theory-driven, that is, it is based on an *a priori* theorizing. Schwartz (1999, 2006) argues that values evolve “as societies confront a set of basic and inevitable issues or problems that arise in regulating human activity”. Over time, each society develops a preferred way of responding to these basic issues. The first basic issue that all societies confront refers to the nature of the relationship between the individual and the group: to what extent are people autonomous vs. embedded in their groups? As he explains, here basically there are two major questions: whose interests should take precedence, the individual’s or the group’s, and to what extent are people autonomous vs. embedded in their groups? The two polar value dimensions in this respect are *autonomy* (two types of autonomy are *intellectual autonomy* and *affective autonomy*) versus *embeddedness*.

<sup>5</sup> Guiso et al. (2006) also argues in favor of using as narrow a concept of culture as possible.

The second basic issue that confronts all societies is to guarantee the responsible behavior that preserves the operation of the society. One polar solution to this issue uses power differences, relying on hierarchy. The value type expressive of this view is *hierarchy* which is a cultural emphasis on the legitimacy of an unequal distribution of power, roles and resources. An alternative solution to the problem is to induce individuals to recognize each other as equals, which is called *egalitarianism*.

The third basic issue that confronts all societies is the relationship between humankind and the natural and social world. One response to this problem is actively to master and change the world, to assert control, and exploit it, which is *mastery*. On the other hand, *harmony* means an emphasis on fitting harmoniously into the environment rather than changing or exploiting it.

To summarize, in the Schwartzian theory there are seven value types, characterized by both contradictions and complementarities, leading to an integrated structure of cultural values.<sup>6</sup>

More recently Schwartz (2014) seems to refine his concept by questioning the “sharedness” of the core feature of the culture. Instead, he argues that culture is a latent, hypothetical construct which cannot be observed directly, and the rich complex of beliefs, practices, symbols, norms, and values prevalent among people in a society are simply among the manifestations of the underlying culture, but they are not the culture itself.<sup>7</sup> Accordingly, culture is seen as a latent normative value system, which is external to the individual, and underlies the functioning of societal institutions (Schwartz 2009, 2014). Despite the fact that the values of individuals vary because of their different experiences, social locations, and genetic inheritance, Schwartz (2011) clearly argues that averaging the values of individuals can provide a “good window into the prevailing societal culture” because the mean values reflect the latent cultural value orientations to which all societal members are exposed and to which they adapt. These means serve as manifest markers for the latent culture and can be used to measure cultural differences.

So in this theoretical framework culture is expressed in the functioning of institutions, in their organization and practices, and it is not something that stands “alone” in itself. As argued above, this view of culture offers an important advantage vis-à-vis the “black box view”, namely that it is in full harmony with institutional economics theories: the theory of the hierarchy of institutions (Williamson 2000) and the theory of institutional stickiness (Boettke et al. 2008). And relying on theories allows us to see the effects of culture on economic development in a more precise way.

<sup>6</sup> The meanings of the seven value types and their constituting items are summarized in Table 1 in the Appendix.

<sup>7</sup> The reason behind his conceptual refinement is the findings of Fischer and Schwartz (2011), who found that the within-country variance in values was substantially greater than the between-country variance, which poses a serious challenge to theories that view cultures as shared meaning systems in which values play a central role.

## **Institutional economics theories and the hypotheses about the effect of values**

My hypotheses about the impact of individual values stem from two influential theories in institutional economics.

One is the theory of the hierarchy of institutions developed by Williamson (Williamson 2000). Williamson's idea is that various institutions are related to and depend on each other, where the direction and the concrete form of the dependence are determined by a hierarchy of institutions. He distinguishes three levels of institutions, of which only level 1 and 2 are important for my concerns.<sup>8</sup> The first level is related to embeddedness, where customs, norms, religions, and traditions play the major role – these are informal institutions. Values are located here. At this level social changes take place very slowly; consequently the institutions here act as external and unalterable conditions on individuals. At the second level we have the formal “rules of the game” (North 1990), i.e., constitutions, political institutions, laws, courts, institutions of enforcement and property rights, representing the institutional environment. Here the frequency of change of the institutions is more intense than at level 1.

In this model, the higher institutional level imposes constraints on the development of the level immediately below. When it comes to the individual values located at level 1, they must be seen as given, i.e., constraints from the perspective of the institutional change at level 2, meaning that values, together with other informal institutions, serve as sources of motivation for, and justification of, the development of formal institutions. Accordingly, values (culture) operate as a constraint due to their nature, and at the same time, they coordinate individuals' expectations. By doing so, cultural values reduce the costs of developing and sustaining the formal institutions that are compatible with them.

From my perspective, the fact that individual values are constraints from the perspective of formal institutions is only one side of the coin; the other side concerns the way in which the impact of values on economic development is mediated: does it work through certain formal institutions or directly?

An answer to this question can be derived from the theory of institutional stickiness developed by Boettke et al. (2008). The authors believe that their theory helps us understand *how* history matters in development, complementing in this way the institutional path-dependency theory of North (1990). Boettke et al. (2008) proposes a new taxonomy of institutions based on the origins of institutions: foreign-introduced exogenous (FEX) institutions, indigenously introduced exogenous (IEX) institutions and indigenously introduced endogenous (IEN) institutions (see Figure 2 in the Appendix).<sup>9</sup>

<sup>8</sup> At the third level we have the governance structures, namely firms, markets and hybrid forms. The fourth level is the one at which resource allocation takes place. The model is shown in Figure 1 in the Appendix.

<sup>9</sup> The foreign or indigenous component in each of these categories is self-explanatory; exogenous institutions are constructed and imposed, endogenous institutions emerge spontaneously as the result of individuals' actions, and are not formally designed.

IEN institutions associated with spontaneous order evolve informally over time. "As spontaneous orders, IEN institutions have their roots in the behavior of individual agents pursuing their own ends" (ibid p. 337). IEN institutions are grounded in the practices, customs, values, and beliefs of indigenous people. Both characteristics of IEN institutions, namely their indigenous introduction as well as their endogenous emergence strongly suggest that they are founded in *metis*.

The concept of *metis* comes from ancient Greeks, and includes skills, culture, norms, and conventions, all of which are shaped by the experiences of the individual. So, clearly, individual values are part of *metis*. Through numerous examples Boettke et al. (2008) show that *metis* can be thought of as the glue that gives institutions their stickiness. They also explain that IEN institutions ensure their foundation in *metis* for two reasons. First, they emerge endogenously and directly from *metis*. Secondly, they are in harmony with local conditions, attitudes, and practices. In this sense IEN institutions are institutionalized *metis*, and the stickiest institutions of all.

What makes this framework especially important for my concern is the acknowledgment that individual values belong to *metis*, and that the basic formal institutions of a society such as the constitution, rule of law, and property rights should be classified as IEN institutions. Having said that, my argument is that endogenous formal institutions are institutionalized values, that is, values are crystallized in those formal IEN institutions which stick to *metis*.

IEN institutions, being formal ones, are located at level 2 in the Williamsonian framework. However, here not all institutions are IEN institutions; some, such as state-made laws and regulatory institutions, are IEX institutions which are exogenously introduced (by the state, for instance) and not as sticky as IEN institutions. As can be seen in Figure 2, the connection to *metis*, that is, the stickiness, weakens when we move from IEN to FEX institutions.

The two hypotheses I can derive from the above two institutional economics theories are the following. First, individual values as being part of *metis* are *fully* embodied and crystallized in the IEN institutions (the most basic spontaneously evolved formal institutions), such as the rule of law, the constitution, etc. Accordingly, their impact on development works via these institutions, meaning that they do not have any effect on development beyond the effect of the IEN institutions. Secondly, since IEX institutions are stuck to individual values to a lower extent, values are expected to have a direct effect on development after controlling for IEX institutions.

### Regression analysis

In what follows I will carry out empirical investigations to provide evidence for the above hypotheses. The main focus is on long-term development, and not on short-term growth. This is why I will be interested in explaining income levels rather than growth rates. The empirical analysis will consist of cross-country regression analysis in which I will rely on the following model:

$$\ln(\text{GDP per capita})_i = \text{const} + \beta_1 \ln(\text{values})_i + \beta_2 \ln(\text{institution})_i + \mathbf{X}'\beta + \varepsilon_i$$

where the variable *values* is the measure of individual values, the variable *institution* is the measure of an IEN or IEX formal institution, while the vector  $\mathbf{X}$  includes certain control variables (human capital investment, geography variables), and  $\varepsilon_i$  is the error term. The dependent variable is per capita GDP in 2010 from the Penn World Table (PWT) 7.1.

The main independent variable *values* is from the Schwartz Value Survey (SVS) which has been built up since 1988. The 46 abstract items (e.g., social justice, humility, creativity, social order, pleasure, ambition) that have reasonably equivalent meanings in each country have been used to construct the seven values (*embeddedness, affective autonomy, intellectual autonomy, hierarchy, egalitarianism, harmony, mastery*) discussed above (see Table 1 in the Appendix). I will only use the *teachers* subsample and will not use the *students* subsample to assure that the social status of the respondents is the same. Since values are assumed to be relatively time-invariant I will include as many observations as possible taken from all the waves of the survey, and take the mean of the scores for each value.

The variable *institution*, in some specifications, is an IEN institution, while in other specifications, it is an IEX institution. As an IEN institution, I will use the Area 2 sub-index (in its chain-linked form, averaged from 1990 to 2010) of the Economic Freedom of the World Index (EFW) compiled by the Fraser Institute (Gwartney et al. 2012). This measure is widely used in the literature to capture the rule of law and the security of property rights.<sup>10</sup> To minimize the omitted variable bias, as robustness checks I will alternatively use two other measures for the IEN institution: the rule of law<sup>11</sup> (averaged from 1996 to 2010), and voice and accountability<sup>12</sup> (averaged from 1996 to 2010) from the World Governance Indicators (WGI) developed by Kaufmann et al.<sup>13</sup> As an IEX institution I will use the Area 5 sub-index of the EFW Index (averaged from 1990 to 2010), capturing state-introduced institutions (credit market, labor market and business regulations).

Amongst control variables, as a measure for human capital I will use the index of human capital from the PWT 8.0, and as a widely used geographical variable, the latitude of country centroid from Gallup, Sachs and Mellinger's Geography Datasets<sup>14</sup>.

For the sake of comparison, instead of *values* I will use an alternative measure for culture, the *culture index* developed by Williamson and Mathers (2011) using *trust, respect, obedience, self-determination* from WVS.

Since data availability poses a constraint on the number of countries, 56 countries will be included in the cross-country regressions. Concerns may arise about potential

<sup>10</sup> The Area 2 sub-index includes the following: judicial independence, impartial courts, protection of property rights, military interference in rule of law and politics, integrity of the legal system, legal enforcement of contracts, regulatory restrictions on the sale of real property, reliability of police, business costs of crime (Gwartney et al. 2012).

<sup>11</sup> Rule of law measures the extent to which individuals "have confidence in and abide by the rules of society, and in particular, the quality of contract enforcement, the police, and the courts, as well as the likelihood of crime and violence" (Kaufmann et al. 2010:4).

<sup>12</sup> Voice and accountability captures "perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media" (Kaufmann et al. 2010:4).

<sup>13</sup> Available at: <http://info.worldbank.org/governance/wgi/index.aspx#home>

<sup>14</sup> Available at: <http://www.cid.harvard.edu/ciddata/geographydata.htm>

reverse causality, of course. But the concept of individual values suggests an answer in this respect: since values are inherited from generation to generation rather than being voluntarily acquired, they are “largely a ‘given’ to individuals throughout their lifetimes” (Becker 1996:16). Accordingly, the risk of reverse causality is very low, so I run only OLS regressions.

Table 2 shows the impact of particular values on per capita GDP. Of course, based on the theory, not all values are expected to exercise a significant effect on income. As can be seen in columns 1-4, *embeddedness*, *hierarchy* and *mastery* are significant separately, and when adding *hierarchy* to *embeddedness* the performance of the model increases while both remain statistically significant. The significance of these three values is in full harmony with what I expected based on the concept of these values. The explanatory power of the values is relatively high (adjusted  $R^2$  is between 0.31 and 0.4). In columns 6-8, when adding various usual control variables (human capital and central latitude of country centroid) the explanatory power of the model increases greatly, of course, and each value retains its significance. So, the results suggest that individual values have a direct effect on income when no institutional variable is included in the regression.

In Tables 3-5 I include an IEN institution, the Area 2 sub-index of the EFW Index, the rule of law, and the voice and accountability measure from the WGI, respectively. For the sake of comparison in column 9 I will use an alternative measure for culture, the culture index. Column 1 in each table contains a very standard model including an institutional variable together with a geographical and human capital variable. The *institution* and the *human capital* variables are always significant at a 1% level, while the geographical variable is only significant in some specifications with the WGI voice and accountability measure. The explanatory power of the models is high. These results clearly confirm the findings of the literature, namely that formal institutions, human capital and geography<sup>15</sup> matter for development.

In columns 2 to 8 (in Tables 3 to 5) I include a particular *value* in the model, which is never significant, and what is more, the pattern of results is the same with all the three IEN institutions, meaning that the results are robust. First of all, while the *value* variable is not significant, the human capital and IEN institution variables retain their significance. Furthermore, the coefficients of the other three independent variables remain more or less the same and the explanatory power of the model also remains the same. However, when adding the culture index the picture changes: for each independent variable the coefficient changes greatly, and the culture index is significant. What do these findings mean?

They mean that individual values do not affect income beyond formal IEN institutions, geography and human capital, and this effect is different from that of the culture index. The results suggest that “culture” as measured by the culture index works both directly and indirectly since its inclusion changes the coefficient of the *human capital* and *institution* variables. As opposed to that, the effect of *values* seems to be

<sup>15</sup> The role of geography, however, is debated in the literature: one strand argues for a direct impact of geography on income (e.g., Sachs 2003), another shows that it only works through institutions (e.g., Acemoglu and Johnson 2005). This controversy is somewhat reflected in my results, too.

fully embodied in the very sticky IEN institutions, based on the theory of institutional stickiness.<sup>16</sup> So clearly, values and the culture index express different things.

In Table 6 as *institution* I include the Area 5 sub-index of the EFW Index, a measure for an IEX institution. My hypothesis seems to be verified since here the results are different from those in Tables 2 to 5; most importantly those values that have been demonstrated to affect income in Table 2 (*embeddedness*, *hierarchy* and *mastery*) here becomes statistically significant. This may mean that individual values may have a direct impact on income after controlling for less sticky exogenous institutions.

## Conclusion

In this paper my aim has been to contribute to a better understanding of the impact of culture on economic development. In this endeavor, on the one hand, in order to conceptualize and measure culture in a richer manner, I have drawn upon the theory of cultural value orientation in cross-cultural psychology (Schwarz 1996); and on the other hand, to formulate theory-driven hypotheses about the possible effect of individual values (in terms of culture) on development I have relied on two institutional economics theories.

Based on these, I have argued that values are *fully* embodied and crystallized in the stickiest formal institutions because they belong to *metis*, to which the endogenously developed formal institutions (IEN institutions) stick. Accordingly, values are not expected to have an affect on development after controlling for IEN institutions. They are, however, supposed to exercise a direct impact on income when controlling for those formal institutions that are stuck to them to a lower extent (IEX institutions). My empirical analyses have provided first-hand evidence for my hypotheses. However, I acknowledge that one must be very cautious when interpreting the empirical results, since omitted variable bias may apply, so it is possible that even more robustness checks may be very useful, which is not easy given certain generally accepted problems relating to the measurement of institutions (see Voigt 2013).

<sup>16</sup> This finding, I believe, is in line with the argument of Licht (2001) who calls “the mother of all path dependencies”.



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## Appendix

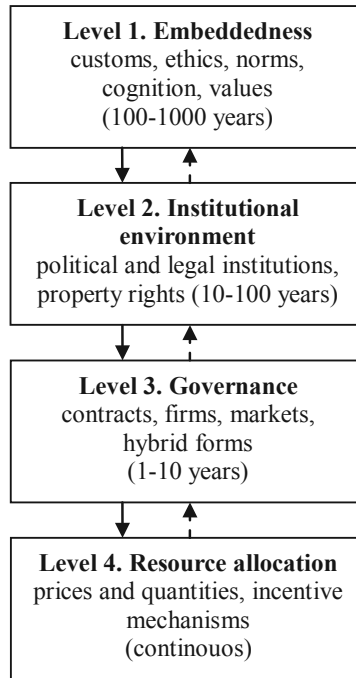


Figure 1. Levels of social analysis

Source: Williamson (2000:597)

Note: bold arrows represent constraints; broken arrows represent some feedback mechanisms that are negligible according to Williamson

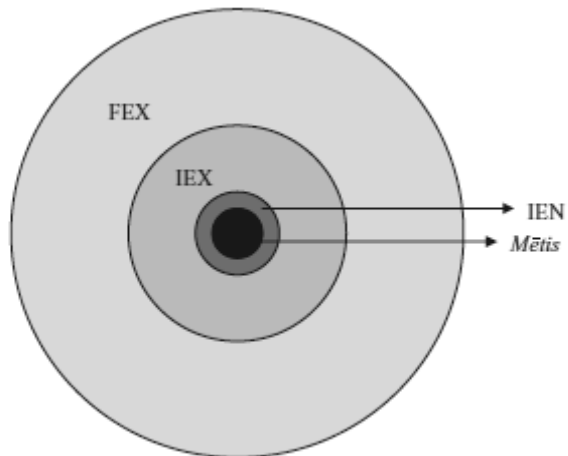


Figure 2: Institutional stickiness

Source: Boettke et al. (2008: 344)

<b>Harmony</b>	The world is accepted as it is. Groups and individuals should fit harmoniously into the natural and social world, avoiding change and self-assertion to modify them.
	World of Peace, Unity with Nature, World of Beauty, Protecting Environment
<b>Embeddedness</b>	The person is viewed as embedded in a collectivity, finding meaning in life largely through social relationships and identifying with the group. A cultural emphasis on maintenance of the status quo, propriety, and restraint of actions or inclinations that might disrupt the solidarity group or the traditional order.
	Social Order, Politeness, National Security, Reciprocation of Favors, Respect of Tradition, Self-Discipline, Wisdom, Moderate, Honoring Parents and Elders, Preserving Public Image, Obedient, Devout, Forgiving, Clean
<b>Hierarchy</b>	A hierarchical, differential allocation of fixed roles and of resources is the legitimate, desirable way to regulate interdependencies. People are socialized to comply with the obligations and rules and sanctioned if they do not. A cultural emphasis on the legitimacy of an unequal distribution of power, roles and resources.
	Social Power, Wealth, Authority, Humble, Influential
<b>Mastery</b>	Groups and individuals should master, control, and change the social and natural environment through assertive action in order to further personal or group interests. A cultural emphasis on getting ahead through active self-assertion.
	Social Recognition, Independent, Ambitious, Daring, Influential, Choosing Own Goals, Capable, Successful
<b>Affective autonomy</b>	The person is an autonomous, bounded entity and finds meaning in his/her own uniqueness, seeking to express own internal attributes (preferences, traits, feelings) and is encouraged to do so. Affective Autonomy promotes and protects the individual's independent pursuit of own affectively positive experience.
	Pleasure, Exciting Life, Varied Life, Enjoying Life, Self-Indulgent
<b>Intellectual autonomy</b>	The person is an autonomous, bounded entity and finds meaning in his/her own uniqueness, seeking to express own internal attributes (preferences, traits, feelings) and is encouraged to do so. Intellectual Autonomy has a cultural emphasis on the desirability of individuals independently pursuing their own ideas and intellectual directions.
	Freedom, Creativity, Broadminded, Curious
<b>Egalitarianism</b>	Individuals are portrayed as moral equals, who share basic interests and who are socialized to transcend selfish interests, cooperate voluntarily with others, and show concern for everyone's welfare. People are socialized to as autonomous rather than interdependent because autonomous persons have no natural commitment to others.
	Equality, Social Justice, Loyal, Honest, Helpful, Responsible

Table 1: Individual values, their meanings and items  
Source: the descriptions are taken from Schwartz (1999), the items are from the Schwartz Value Survey

dependent variable: ln per capita GDP in 2010								
	1	2	3	4	5	6	7	8
constant	15,157 (20,898)***	11,837 (42,01)***	13,977 (19,754)***	17,869 (13,487)***	(1,181) (0,606)	5,850 (2,697)***	3,956 (2,148)**	5,930 (2,564)**
ln(embeddedness)	-4,069 (-7,169)***		-2,260 (-3,109)***			-1,925 (-4,323)***		
ln(hierarchy)		-2,5689 (-6,499)***	-1,476 (-2,671)**				-1,065 (-3,261)***	
ln(mastery)				-6,048 (-5,997)***				-2,340 (-2,783)***
ln(hc)					4,485 (10,19)***	3,862 (8,192)***	3,807 (7,911)***	3,961 (9,126)***
ln(cen_lat)					0,785 (2,113)**	0,493 (1,369)	0,546 (1,581)	0,576 (1,579)
N	56	56	56	56	53	53	53	53
R <sup>2</sup>	0,37	0,37	0,42	0,32	0,57	0,63	0,62	0,61
adjusted R <sup>2</sup>	0,36	0,36	0,40	0,31	0,55	0,61	0,59	0,58

Table 2: OLS regressions on ln per capita GDP in 2010 with individual values as independent variables  
T-statistics are in parentheses, standard errors are robust. Letters in the upper index refer to significance: \*\*\*, significance at 1%, \*\*, significance at 5%, \*, significance at 10%. T-values without an index mean that the coefficient is not significant even at the 10% level.

dependent variable: ln GDP per capita, 2010									
	1	2	3	4	5	6	7	8	9
constant	1,489 (0,973)	-0,121 (-0,045)	2,554 (0,981)	2,078 (1,050)	3,462 (1,640)	1,711 (1,266)	-1,110 (-0,380)	-1,560 (-0,423)	2,804 (2,098)**
ln(cen_lat)	0,342 (1,340)	0,294 (1,276)	0,305 (1,082)	0,310 (1,166)	0,277 (1,051)	0,334 (1,348)	0,323 (1,361)	0,438 (1,464)	0,276 (1,103)
ln(hc)	2,692 (7,028)***	2,587 (6,262)***	2,673 (7,032)***	2,629 (6,988)***	2,567 (6,739)***	2,669 (6,284)***	2,536 (6,701)***	2,766 (7,269)***	1,704 (3,121)***
ln(area2ch_av_90_10)	1,983 (5,763)***	2,058 (5,320)***	1,844 (3,684)***	1,889 (4,259)***	1,878 (5,227)***	2,024 (4,373)***	1,933 (5,620)***	1,937 (5,919)***	1,528 (3,687)***
ln(harmony)		1,228 (1,122)							
ln(embeddedness)			-0,448 (-0,690)						
ln(hierarchy)				-0,232 (-0,606)					
ln(mastery)					-0,980 (-1,354)				
ln(affective autonomy)						-0,200 (-0,253)			
ln(intellectual autonomy)							1,949 (1,458)		
ln(egalitarianism)								1,625 (1,185)	
ln(culture index)									0,602 (2,203)**
N	53	53	53	53	53	53	53	53	49
R <sup>2</sup>	0,74	0,75	0,75	0,75	0,75	0,75	0,76	0,76	0,74
adjusted R <sup>2</sup>	0,73	0,73	0,73	0,73	0,73	0,73	0,74	0,73	0,72

Table 3: OLS regressions on ln per capita GDP in 2010 with the Area2 sub-index of the EFW Index and individual values as independent variables

T-statistics are in parentheses, standard errors are robust. Letters in the upper index refer to significance: \*\*\*, significance at 1%, \*\*, significance at 5%, \*; significance at 10%. T-values without an index mean that the coefficient is not significant even at the 10% level.

dependent variable: ln per capita GDP in 2010									
	1	2	3	4	5	6	7	8	9
constant	4,901 (4,080)***	3,766 (1,984)*	5,846 (3,087)***	5,589 (3,785)***	6,627 (3,509)***	5,169 (3,435)***	2,796 (1,168)	3,120 (1,103)	5,536 (4,307)***
ln(cen_lat)	0,375 (1,511)	0,346 (1,381)	0,328 (1,188)	0,322 (1,217)	0,311 (1,184)	0,371 (1,498)	0,365 (1,493)	0,434 (1,578)	0,284 (1,162)
ln(hc)	2,388 (4,681)***	2,329 (4,401)***	2,368 (4,704)***	2,286 (4,762)***	2,276 (4,584)***	2,366 (4,161)***	2,297 (4,613)***	2,460 (4,971)***	1,527 (2,538)**
RoL_av_96_10	0,623 (4,522)***	0,632 (4,473)***	0,582 (3,154)***	0,590 (3,611)***	0,594 (4,059)***	0,633 (3,734)***	0,604 (4,411)***	0,607 (4,626)***	0,482 (3,693)***
ln(harmony)		0,910 (0,947)							
ln(embeddedness)			-0,487 (-0,723)						
ln(hierarchy)				-0,337 (-0,864)					
ln(mastery)					-0,930 (-1,209)				
ln(affective autonomy)						-0,182 (-0,231)			
ln(intellectual autonomy)							1,504 (1,215)		
ln(egalitarianism)								0,906 (0,769)	
ln(culture index)									0,563 (2,578)**
N	53	53	53	53	53	53	53	53	49
R <sup>2</sup>	0,77	0,77	0,77	0,77	0,77	0,77	0,77	0,77	0,77
adjusted R <sup>2</sup>	0,75	0,75	0,75	0,75	0,75	0,75	0,76	0,75	0,75

Table 4: OLS regressions on ln per capita GDP in 2010 with the Rule of Law and individual values as independent variables

T-statistics are in parentheses, standard errors are robust. Letters in the upper index refer to significance: \*\*\*: significance at 1%, \*\*: significance at 5%, \*: significance at 10%. T-values without an index mean that the coefficient is not significant even at the 10% level.

dependent variable: ln per capita GDP in 2010									
	1	2	3	4	5	6	7	8	9
constant	3,955 (3,744)***	4,180 (2,030)**	5,245 (2,704)***	4,236 (2,971)***	5,365 (2,866)***	3,794 (2,687)***	2,708 (1,100)	2,625 (0,909)	5,311 (4,939)***
ln(cen_lat)	0,504 (2,164)**	0,507 (2,195)**	0,437 (1,621)	0,482 (1,871)*	0,453 (1,758)*	0,507 (2,196)**	0,504 (2,164)**	0,549 (2,082)**	0,282 (1,283)
ln(hc)	2,771 (5,500)***	2,767 (5,472)***	2,771 (5,528)***	2,751 (5,581)***	2,708 (5,679)***	2,784 (5,081)***	2,757 (5,503)***	2,841 (6,106)***	1,526 (2,177)**
VAc_av_1996_2010	0,584 (3,480)***	0,587 (3,627)***	0,509 (2,226)**	0,557 (2,619)**	0,545 (2,898)***	0,577 (2,842)***	0,559 (3,526)***	0,564 (3,654)***	0,450 (3,800)***
ln(harmony)		-0,159 (-0,152)							
ln(embeddedness)			-0,678 (-0,908)						
ln(hierarchy)				-0,157 (-0,362)					
ln(mastery)					-0,784 (-0,998)				
ln(affective autonomy)						0,117 (-0,144)			
ln(intellectual autonomy)							0,848 (0,668)		
ln(egalitarianism)								0,661 (0,506)	
ln(culture index)									0,758 (3,971)***
N	53	53	53	53	53	53	53	53	49
R <sup>2</sup>	0,70	0,70	0,71	0,70	0,70	0,70	0,70	0,70	0,75
adjusted R <sup>2</sup>	0,68	0,68	0,68	0,68	0,68	0,68	0,68	0,68	0,72

Table 5: OLS regressions on ln per capita GDP in 2010 with Voice and Accountability and individual values as independent variables  
T-statistics are in parentheses, standard errors are robust. Letters in the upper index refer to significance: \*\*\*: significance at 1%, \*\*: significance at 5%, \*: significance at 10%. T-values without an index mean that the coefficient is not significant even at the 10% level.



dependent variable: ln per capita GDP in 2010									
	1	2	3	4	5	6	7	8	9
constant	-0,644 (-0,264)	-1,602 (-0,437)	3,932 (1,332)	2,113 (0,857)	4,052 (1,419)	-1,188 (-0,544)	-3,691 (-1,007)	-4,034 (-0,884)	2,101 (1,245)
ln(cen_lat)	0,855 (2,303)**	0,840 (2,377)**	0,573 (1,529)	0,620 (1,785)*	0,648 (1,761)*	0,843 (2,254)**	0,817 (2,460)**	0,951 (2,410)**	0,514 (2,009)*
ln(hc)	4,000 (9,006)***	3,965 (8,908)***	3,452 (7,895)***	3,351 (7,810)***	3,492 (7,773)***	3,992 (9,736)***	3,777 (8,968)***	4,072 (9,113)***	2,333 (3,896)***
ln(area5_ av_1990_2010)	1,081 (2,099)**	1,113 (2,020)**	0,989 (1,924)*	1,053 (2,041)**	1,066 (2,080)**	0,995 (1,727)*	1,039 (2,066)**	1,008 (2,070)**	0,735 (1,570)
ln(harmony)		0,685 (0,559)							
ln(embeddedness)			-1,823 (-3,606)***						
ln(hierarchy)				-1,039 (-3,033)***					
ln(mastery)					-2,301 (-2,510)**				
ln(affective autonomy)						0,640 (0,787)			
ln(intellectual autonomy)							2,346 (1,544)		
ln(egalitarianism)								1,877 (1,171)	
ln(culture index)									0,879 (3,433)***
N	53	53	53	53	53	53	53	53	49
R <sup>2</sup>	0,61	0,61	0,67	0,66	0,65	0,62	0,63	0,63	0,68
adjusted R <sup>2</sup>	0,59	0,58	0,64	0,63	0,62	0,59	0,60	0,60	0,66

Table 6: OLS regressions on ln per capita GDP in 2010 with the Area5 sub-index of the EFW Index and individual values as independent variables  
T-statistics are in parentheses, standard errors are robust. Letters in the upper index refer to significance: \*\*\*: significance at 1%, \*\*: significance at 5%, \*: significance at 10%. T-values without an index mean that the coefficient is not significant even at the 10% level

Andrea Pöstényi

## Role of Institutions in the Economic Development of Latin America

The countries of the Latin American continent possess numerous similar economic, political and historical traits, if we consider the years of colonization and subsequent exploitation, the struggles for independence and the rise of different dictatorships. In our present period however, we can see significant differences between these countries; the reasons for these must be searched for in the various reforms and institutions.

Many definitions have been created to help determine what institutions are; Douglass C. North (2001:97) defined institutions as “humanly devised constraints that structure political, economic and social interactions”. According to Acemoglu et al. (2003a), institutions have a significant effect on economic performance. Weak institutions have a negative effect on the specific country’s economy, because in countries with weak institutions there are relatively few tools to limit decision makers. After a political change in these countries, the group with greater power can redistribute incomes according to its own interests, while in countries with strong institutions the institutions prevent such redistribution. As there are few options to limit the power of decision makers in countries with weak institutions, a fierce struggle starts for political power, which can in turn cause more significant political and economical turmoil. With weak institutions, politicians are forced to pursue unsustainable policies in order to serve the interests of different groups and stay in power. Furthermore, in such an institutional environment, entrepreneurs tend to invest in business sectors from which they can easily withdraw their capital, thereby adding to the potential economic instability (Acemoglu et al 2003a). When weak institutions are examined, Latin America is often considered as an example, even though the region has gone through significant changes in the last two or three decades and it is not nearly as homogeneous and vulnerable as it was before.

### **The effect of colonization and independence on the institutional system**

The wave of European colonization beginning in the fifteenth century greatly transformed the social and economic institutions in Latin America. One of colonialism’s most striking effects is that while the Inca and Aztec civilizations were counted amongst

the most wealthy of civilizations in the fifteenth century, nowadays we can mostly find poor countries in their former territories, while the previously underdeveloped North America had become one of the world's most advanced areas by the twentieth century (Acemoglu et al 2002).

Numerous historical and economical data indicate that, as an effect of the European colonization, an institutional reversal occurred. During colonization, the densely populated and urbanized regions found themselves in a worse institutional situation, because in these regions it was in the Europeans' interest to have institutions which made it easier to exploit available resources; therefore they had no respect for property rights. Typically, a narrow circle of elites grabbed control; because of their small number, they gained a significant share of production, which further stimulated the exploitation system. The most important resources were gold, silver, valuable agricultural products, and the people living there. The European settlers took advantage of the densely populated areas in two ways: on the one hand, they gained a source of income in the form of taxes, and on the other hand they had a large labour force working in the mines and on the fields. With such motives it is clear why they did not respect the rights of the people, and why it was in their interest to create worse economic institutions. In these areas the danger of expropriation scared away investments, which had a negative effect on economic development. At the time of colonization the relatively poorer areas were less populated and a large number of European settlers flowed into them. It was in their interest to create institutions protecting their own property rights; therefore these areas were able to show significant development over time. (Acemoglu et al 2002).

By looking at the economic effects of colonization we have to note, that European colonization has increased the GDP per capita in Latin America due to a number of factors. The opening of American colonies to world trade, the adoption of European technology, flora and fauna, plus the two great demographic catastrophes (the death of native population, and large scale African migration) have all contributed to the increase of income per capita. Latin America was not considered underdeveloped by any traditional indicators until a time somewhere between 1750 and 1850 (see Table 1). During the colonization era, the area showed unparalleled growth, but problems had already begun to appear just one century later when the productivity gains of Spanish rule started to diminish. At the end of the sixteenth century, silver production in Peru collapsed, Mexican production stagnated for most of the seventeenth century, and production per capita dropped by half. By the end of the colonization era, precious metal production accounted for less than 10 per cent of Andean and Mexican GDP. At the end of the seventeenth century the most productive Latin American countries were small Caribbean islands where slaves worked on sugar cane plantations. In these countries the cane sugar export reached 30-40 percent of GDP, while GDP per capita approached European levels (Coatsworth 2008).

Table 1

**Changes in GDP per capita between 1500 and 2001 (USD)**

	1500	1600	1700	1800	1820	1850	1870	1900	1930	1950	1980	2001
<b>Argentina</b>				1194			1311	2756	4080	4987	8206	8137
<b>Brazil</b>	400			422	646	704	713	678	1048	1672	5198	5570
<b>Chile</b>				539				1949	3143	3821	5738	10001
<b>Colombia</b>				395				973	1474	2153	4265	5087
<b>Cuba</b>				1312		1409			1505	2046	2664	2477
<b>Mexico</b>	550	755	755	755	566	592		1157	1618	2365	6289	7089
<b>Peru</b>				480				817	1417	2263	4205	3630
<b>Latin America</b>	550	703	674	703	713		749	1200	1914	2700	5886	6327
<b>USA</b>	400	400	527	1171	1257	1806	2445	4091	6213	9561	18577	27948

Source: Coatsworth 2008:547.

By the beginning of the eighteenth century, the previously poor colonial territories outpaced the former highly industrialized territories. Although the originally more industrialized areas could show higher levels of urbanization and growth until the 1800s, from the end of the eighteenth century onwards, the previously poorer colonies achieved higher growth, and this divergence proved lasting. The main cause behind this turn was industrialization, during which the role of institutions became more valuable, accompanied by the appearance of new investment possibilities, which required high levels of property protection (Acemoglu et al. 2003b). According to Coatsworth (2008), the main factor behind the setback of the Latin American area was that the basis of technological and organizational innovation required for industrialization was not established with the Spanish/Portuguese colonization, and this caused a serious divergence began from the nineteenth century industrial revolution. The research of Acemoglu et al. (2002) also strengthens this concept; the data shows that the role of institutions formed during the colonization period was also significant for the industrialization process in the nineteenth century, which later limited the long-term growth possibilities.

Regarding colonization, apart from the factors presented here, the colonists' cultural and religious differences may also have played a role in economic development, although this view divides the literature. One of the main arguments for this is that different value systems developed in Latin America and in North America, because the religious attitude of the Spanish and Portuguese accepted poverty as a factor over which people have no influence. Many people in Latin America say that poverty is one of God's trials (Sheahan-Iglesias 1998). In contrast, North America has seen the spread of Protestant religion, which fits more with market institutions, and therefore could have had a positive effect on economic development (Engerman-Sokoloff 2005).

In the first half of the nineteenth century, after the colonial era, the Latin American countries become independent one after the other, but independence itself did not turn out to be a panacea for previous institutional problems. Although some of the institutional elements became non-viable, and the birth of modern constitutions

was accompanied by a number of laws and reforms (Coatsworth 2008), the colonists' exploitative institutions persisted for a long time after the end of colonialism. In Latin America, the system of state monopolies remained until almost the end of the nineteenth century. Also forced labour, one of the most characteristic elements of the colonial era, not only remained after the countries gained their independence, but also intensified with the spread of export oriented agriculture. For example, slavery was present in Brazil until 1886, while in Mexico forced labour was reintroduced with the boom of sisal cultivation, and it persisted until 1910 (Acemoglu et al 2001). The modernization of the legal system, trade regulation and the government structure took decades after gaining independence. Furthermore, developed countries hindered the industrialization of these newly independent countries, because due to the industrial revolution, manufactured imports became cheaper and the demand for natural resources increased. Therefore, the nineteenth century meant de-industrialization for a number of countries, i.e. the kind of incentives evolved which guided production activities away from local handicrafts and manufacturing to raw materials. At this point, Latin America was in great need of strong governments which could have helped the establishment of modern industry. Following independence, the modernization of institutions occurred in these countries at different speeds. Modernization was faster in areas with a temperate climate: Argentina, Chile and Uruguay. Among the slowest institutional transformation countries was Brazil, the only former slave colony where no political change had occurred before independence. In this category belong Bolivia, Peru and Mexico, where the ruling elite fought for the re-establishment of colonial stability (Coatsworth 2008). We can also note the observation of Acemoglu et al. (2002) here, which is that modernization only started later in those areas which were counted richer in the period before colonization.

Becoming independent had obvious costs, because the countries gaining their independence from the former large and closed system were usually small and open. The colonial system provided protection and jurisdiction for the countries at a relatively low cost. These institutions had to be organized anew. Transaction costs increased, because the political and economic institutions went through a transitional period, while in numerous countries problems emerged in connection with property rights. The damage to previous trade connections resulted in additional problems. These increasing costs discounted the GDP increase, which was caused by the cessation of fiscal obligations to the mother country following independence (De la Escosura 2009).

According to Coatsworth (2008), four factors contributed to the economic growth of the Latin American continent which finally started in the nineteenth century. The first of these factors was the *external economic environment*. With the industrial revolution, transportation costs fell radically, which in turn increased demand for this region's export products. The second important factor was *institutional modernization*. With the dismantling of colonial institutions slavery was gradually abolished, property rights became regulated, and new civil and commercial laws came into force. These developments created the conditions for the establishment of private enterprises. The third factor playing a significant role in economic growth was *political stability*, which was able to solve the conflicts of interest between the elite and working class through different mechanisms. The fourth factor is related to the *government and*

*economic elite*. For example in Mexico, during the governance of Porfirio Díaz, the state manipulated rich investors to invest their capital in areas which it considered needed to be developed. Furthermore, as export driven growth started right across Latin America, economic disparity increased, which in turn motivated politicians and business organizations to get their hands on valuable land. Meanwhile, migration and immigration kept wages low in the growing economy. In this period therefore, inequality, the dominance of a small elite circle, the limitation of competition and the problems related to property and human rights proved to be beneficial for the *region* (Coatsworth 2008).

### **The Latin American debt crisis and the Washington Consensus**

As we have seen, colonization and the independence which followed it had a significant effect on the Latin American institution system. We could observe institutional changes of similar importance in connection with the crises of the eighties and nineties of the 20<sup>th</sup> century, and with the subsequent reform measures.

The pace of economic growth in Latin America gained momentum again after the setback experienced during independence period, and it reached a very high level by the second half of the twentieth century: between 1945 and 1981 the area grew by an average of 5.2 percent. Apart from growth, a number of problems also surfaced: fiscal deficits increased, inflation accelerated, and the debt stock of the countries of the region rose at a higher pace than their debt service capability. As a result of the crisis of the eighties, average economic growth barely reached 1 percent between 1982 and 1989, while the growth of the population did not slow; therefore income per capita significantly decreased and poverty, which was previously on a decreasing path, started to rise again (Szakolczai 2005).

During the 4 decades preceding the crisis, Brazil and Mexico grew at the fastest rate in the region, and later these two countries became the largest debtors. Brazilian and Mexican economic growth also had some unwanted side effects: income inequality, inflation and corruption all increased (Felix 1990). Following the high growth, the signs of instability started to appear in the 1970s: public spending increased, internal and external imbalances occurred, and the ratio of external financing significantly increased. By the end of 1980 several unsettling signs could be recognized in the area. The marginal capital-output rate showed a low level of productivity of investments in many countries. Significant imbalances could be observed in connection with public and private investments, but also in connection with investments aiming at both tradable and non-tradable sectors. In the 1970s, public investments grew faster than private investments in Mexico and Venezuela, due to high oil prices. In Mexico, public investments grew by an average of 11.1 percent, while private investments grew by only 6.6 percent. Investments in the non-tradable sector were usually financed by creating debt, which led to problems later on. Real appreciation in 1980 and currencies tied to the USD made the countries in the region vulnerable. However, in 1980 indicators related to debt and solvency were no worse than in 1973, with the exception of Brazil. In the 1970s, foreign capital in Latin America increased significantly, while loans between 1979 and 1981 were about half the value of exports in Mexico,

Chile and Argentina. From 1981, currency reserves declined significantly in Argentina, Brazil, Chile and Mexico. Procyclical movement of loans exacerbated the decline in exports, which resulted in the most severe crisis since the 1930s. In the second half of 1981 and first half of 1982, Mexico received record loans of 17 billion dollars, and so did Brazil. After the second half of 1982, the Latin American region experienced a significant decline in capital inflows with the exception of Colombia, while the value of exports declined due to deteriorating terms of trade (Diaz-Alejandro et al 1984).

To summarize, the debt crisis in Mexico started due to an inappropriate economic policy, the collapse of oil prices and the rise of international interest rates. At the beginning of the debt crisis, Mexico launched structural reforms, among which the most remarkable were the adjustment of the budget, liberalization, privatization of state owned companies, reduction of the economic role of the state, structural transformation of the financial system and deregulation (Banco de Mexico 1992). Due to the similar economic structure and growing imbalances the crisis quickly spread across the continent; many countries in the region found themselves in a similar situation as Mexico, and thus were forced to take similar reform measures.

Regarding reforms it should be mentioned that from the beginning of the outbreak of the crisis, the strategy adopted by creditors involved four main components. First, they wished to avoid an international banking crisis. Furthermore, it was in their interest to restore the creditworthiness of debtor countries and to transform these economies so that they could achieve sustainable economic growth. It was also in the creditors' interest to set market liberalization as the focus of economic transformation. By the mid-eighties however, the fear in Washington significantly increased that the prolonged crisis in Latin American countries would encourage a political leftwards turn, and thus the Baker Plan was born in October 1985. The main goal of the Plan was economic growth stimulation and market liberalization. Within the framework of the Plan, 17 indebted countries received 29 billion dollars of loans between 1986 and 1988. The Baker Plan intended to alleviate the negative effects of the crisis with the help of loans, but over time it became clear that additional measures would be required. A new package of measures, the Brady Plan was launched in March 1989. Just like the Baker Plan, the Brady Plan also focused on the funding of financial institutions, but the Brady Plan required that the indebted country – besides market liberalization – should follow the stabilizing monetary and fiscal policy approved by the IMF (Felix 1990).

The aim of the measures suggested by Washington was to achieve prudent macroeconomic policy, external orientation and free market capitalism. The recommendations of the Washington Consensus are (Williamson 1990):

1. *Fiscal policy discipline.* According to Williamson (1990) there are different views as to whether fiscal discipline must necessarily mean a balanced budget. One view is that deficits are acceptable in those cases in which they do not result in an increase in the debt ratio. Another approach is that a balanced budget should be used in the medium term, and deficits and surpluses are acceptable in the short term if they serve macroeconomic stabilization.
2. *Priorities of public spending.* According to the recommendation, in order to decrease the fiscal deficit, reductions in expenditures should be implemented instead of raising tax revenues. According to Williamson (1990), international institutions have strong opinions about three categories of public spending:

subsidies, education and health care, and public investments. International institutions recommend decreasing or eliminating non-discriminational benefits, since these not only deprive the budget of resources, but also lead to a wasteful and inadequate allocation of resources. Based on Washington's views, public spending should be directed into education and health care in such a way that the particularly disadvantaged get into a better position. There is a consensus regarding public investments that infrastructure investments are of considerable significance.

3. *Tax reform.* Washington considers it an inappropriate policy to reach fiscal balance by increasing tax revenues, and recommends developing countries adopt a wide tax base and moderate tax rates.
4. *Interest rate policy.* In the Consensus there are two main principles concerning interest rates. First, interest rates should be determined by the market, thus inappropriate allocation of resources can be avoided. The second important factor is that real interest rates should be positive - moderately positive according to Williamson (1990) - in order to encourage investments.
5. *Exchange rate policy.* The dominant view is that it is less important how the exchange rate is determined; the important goal is to reach a competitive exchange rate which helps to increase exports and thereby the economy can grow at a rate permitted by its supply potential, while the current account deficit can be financed in a sustainable way. Washington believes that outward orientation and export growth are the two main goals that Latin America needs to achieve in order to experience a recovery.
6. *Trade policy.* Besides the competitive exchange rates, import liberalization is the second key element of an outward economic policy. Clearly, it is necessary to gain access to imported inputs at competitive prices in order to encourage exports. According to Washington, in cases in which the use of protectionist means is necessary, the best solution is to impose tariffs, as it means that the state gets revenue while distortions created by tariffs can be minimized.
7. *Foreign investments.* According to the Consensus, the liberalization of foreign financial flows is not a high priority, while restrictions on foreign investment may have negative consequences, because foreign direct investments provide capital, abilities and know-how for domestic market or export production.
8. *Privatization.* The main argument for privatization is that due to the different incentives, private companies tend to operate more efficiently than state companies. Moreover, privatization can help to relieve the pressure on the budget, because in the short-term, revenue is generated from the sales of the companies, while in the long term it is not the state who has to finance the investments related to these companies. According to Williamson (1990), although privatization may be positive in cases when it increases competition and decreases fiscal pressure, he does not always favour private companies over state companies.
9. *Deregulation.* Deregulation is another way of encouraging competition. Given that the Latin American economies are among the most strongly regulated markets in the world, they may realize significant benefits by deregulation.



10. *Property rights.* Property rights are very uncertain in Latin America, even though it is a generally accepted fact that property rights are very important for an economy.<sup>1</sup>

In the end of the 1980s and in the 1990s, Latin America went through a significant economic transformation. The reforms applied differ in each country, the most frequently reformed areas being: high inflation, stagnation, low creditworthiness, currency instability, a low level of export, and capital flight. In parallel with the reform programs, the international economic environment improved, which led investors to Latin American markets, but capital inflow did not have only positive effects. Although the inflow of capital helped accelerate reforms by financing the costs of reforms, they also hid the problems behind the poor economic performance of the region, e.g. high income inequality, low productivity and competitiveness, and the inefficiency of state institutions. However one should not underestimate the positive effects of the reforms undertaken. Trade liberalization forced the Latin American countries to become more efficient in a more competitive environment, and the previously state owned, but now privatized, companies could no longer receive competition distorting subsidies. Comparing the mid-eighties to the nineties, the countries of the region significantly improved their fiscal balances, while the rate of inflation in most countries managed to decrease to single figures, with the result that the average inflation rate from 1989 to 1994 fell from 130 percent to 14 percent (Naím 1995).

Reform measures that followed the Latin American debt crisis were widely criticized both for their efficiency as well as their depth. Most of the measures applied belonged to first generation reforms, e.g. macroeconomic stabilization, privatization, tariff reduction, and expenditure reduction. In contrast, the second generation reforms were designed to reform the state, state services and institutions, and the business environment. While first generation reforms have immediate and visible results, the impact of second generation reforms only become apparent in the long term and are less visible; therefore they are politically difficult to implement. For example, while the effects of a tariff reduction are immediate and its costs are distributed across society, reforming health care takes time and its costs affect concentrated groups. Furthermore, institutional reforms are extremely complex, and the empirical experiences of each country are difficult to apply in other countries. Compliance with the recommendations of the Washington Consensus did not, therefore, ensure the conditions for sustainable growth. Moreover, it was a serious mistake that the Consensus did not take into account the impacts of globalization. The Consensus did not provide recommendations which would have allowed the reforming countries to cope better with the consequences of globalization, especially in the financial sector. The crises in the 1990s are a good example of this: between 1994 and 1999, ten middle-income developing countries experienced a major financial crisis that made some countries question the usefulness of previous reforms (Naím 1999).

Over the years it became apparent that the earlier reforms would have no long-term effects if they were carried out in a weak institutional environment. Therefore, a

<sup>1</sup> See the example of colonization.

modification of the Washington Consensus was made which focused on institutional reforms. Reform areas in the modified version are the following: corporate governance, anti-corruption, flexible labour markets, the WTO agreements, financial regulations and standards, prudent capital account opening, a non-temporary exchange rate regime, an independent central bank / inflation targeting, social safety nets, and targeted poverty reduction (Rodrik 2006).

Regarding the first version of the Washington Consensus it is worth mentioning that at a trade summit in December 1994 President Clinton spoke about the fact that Latin American reforms can do wonders, while 9 days later Mexico devalued the peso. The Mexican currency crisis destabilized currencies and financial markets across the world, and the volatility of capital inflow highlighted the continuing vulnerability of Latin America. However, it is worth noticing that governments in the Latin American region reacted differently to the Mexican crises of 1982 and 1994. When Mexico declared insolvency in 1982, the flow of external funds to the region suddenly stopped and governments reacted by closing down their economies, applying extensive economic controls and in some cases nationalizing some banks. In contrast, in 1995 the reaction to the Mexican currency crisis was to deepen market reforms, accelerate privatization plans, fine-tune the foreign exchange regime and strengthen private banks (Naím 1995). Latin American countries have learned some lessons from previous economic downturns.

### **From end of the 1990s to the present day**

Due to the impact of the reform wave in the 1980s, economic growth became significant in the 1990s. However, further crises highlighted the fact that the implemented reforms had not touched those areas which needed extensive transformation and social consensus. The tequila crisis in 1994, then the crises of Brazil in 1998 and Argentina in 2001 highlighted the weak points of the countries involved and made policymakers implement further reforms. The most significant momentum – at least from the viewpoint of the reforms and responses to the crises – of the period following the reform process of the 1980s was the spread of fiscal policy rules in the region. The aim of applying fiscal policy rules is to ensure macroeconomic stability, strengthen the credibility of the government's fiscal policy and create long-term fiscal policy sustainability (Benczes-Kutasi 2010).

In the Latin American region one cannot speak of a decades-long regulatory routine, since most countries introduced fiscal rules in the 2000s after the years of stabilization. Different countries introduced a variety of fiscal rules according to their own capabilities, which became the main pillar of countercyclical policy and contributed to achieving macroeconomic stability and reducing the sensitivity to external shocks (Table 2).

Table 2

**Fiscal policy rules in Latin America**

Country	Year of introduction	Type
Dominican Republic	1998	debt limit
Argentina	2000	general balance, deficit limit, stabilization fund, primary expenditure limit
Chile	2000	structural surplus, stabilization fund
Peru	2000	general balance, deficit limit, stabilization fund, primary expenditure limit
Brazil	2001	general balance, debt reduction, wage limit
Colombia	2001	general balance, debt reduction, wage limit, interest rate limit
Costa Rica	2001	expenditure limit
Panama	2002	general balance, debt limit
Ecuador	2003	non-oil balance, debt limit, stabilization fund, primary expenditure limit
Venezuela	2004	general balance, deficit limit
Mexico	2006	balanced budget, revenue rule

Source: Pöstényi 2012:113 based on Benczes-Kutasi 2010 and Kumar et al 2009.

Latin America enjoyed exceptional economic growth between 2003 and 2007 due to a favourable external economic environment and internal reforms. In this period the growth in the region was 6.2 percent on average, and it was only terminated by the crisis of 2008-09. Porzecanski (2009) emphasizes four economic reforms behind the boom period. The first was reducing the *currency mismatch*, which is important because empirical research shows that it had been a source of many financial crises before. In Latin America, for decades assets and liabilities were denominated in different currencies: assets were denominated in the local currency, while loans were usually denominated in dollars, so financial problems arose when the exchange rate changed. The reduction of the currency mismatch reduced countries' vulnerability to exchange rate changes.

The next important factor is *exchange rate flexibility*, which allows countries to avoid external shocks. From the mid 1990s on, more and more Latin American countries have shifted from rigid to flexible exchange rate regimes with inflation targeting. Following previous crises, the *strengthening of banking systems* and the *spread of countercyclical fiscal policy* have become really important, the latter allowing countries to finance crisis management programs from previously accumulated reserves, instead of from loans.

Ocampo (2011) also studied the economic stability of the Latin American region and found that lower balance of payment deficits, competitive exchange rates, abundant foreign exchange reserves, low levels of short term external liabilities and regulation of foreign capital to avoid overheating also contributed to the reduction of vulnerability.

In 2007, Latin America was not yet affected by the crisis in the areas of economic activities and international trade; the average growth rate of the region reached 5.6 percent. However, problems arose at the third quarter of 2008: the economic growth started to slow, terms of trade deteriorated, and after five years of economic boom current account deficits appeared again. In 2009, terms of trade deteriorated even more, foreign investments dropped by 35-40 percent and with the exception of only a few countries, the continent went into recession. The external shock the region was facing, was greater than the one which caused the Asian crisis in 1997. However, due to the previously mentioned institutional changes, the Latin American countries did not suffer such drastic declines, neither in GDP nor in employment. Furthermore, the signs of economic prosperity were visible in the middle of 2009, which in the light of previous crises surprised the economists (ECLAC 2009).

### Reforms and economic growth

Reform processes launched since the 1980s raise the question of whether these reforms have truly contributed to economic growth and to what extent. Many economists have considered this question (see Table 3); the examples of transition economies provide a good basis for studying the effect of the reforms undertaken.

*Table 3*

### Reforms and economic growth

Study	Subject of research	Result
Sachs (1996)	EBRD countries	significant positive effect
Selowsky-Martin (1997)	EBRD countries	significant negative effect, however it becomes significantly positive with lags
Lora-Barrera (1997)	Latin America	significant positive effect
Christoffersen-Doyle (2000)	EBRD countries	significant positive effect
Escaith-Morley (2000)	Latin America	tax reforms have a significant positive effect, trade reforms have an insignificant effect
De Melo et al (2001)	former Soviet Union, China, Vietnam, Mongolia	significant negative effect, however it becomes significantly positive with lags
Fernández-Arias – Montiel (2001)	Latin America	significant positive effect
Fidrmuc (2001)	former Soviet Union	liberalization has a positive effect
Bandeira-Garcia (2002)	Latin America	significant positive effect
Falcetti et al (2006)	EBRD countries	significant positive effect
Swiston-Barrot (2011)	Central America	significant positive effect

Source: author's compilation based on the specified studies.

As seen in the table above, there is a positive relationship between reforms and economic growth. The results differ due to the different methodologies applied, as some studies focused not only on the relationship between reforms and growth, but also on when the effect occurs. The economic effects of most reforms, especially far-reaching measures, do not take place immediately; in some cases it takes years for the reforms to become growth promoting factors. For example, Sala-i-Martin et al. (2003) show that there is a positive relationship between the years of openness and economic growth, so the effects of economic liberalization become more significant with time. In some cases it can be shown that reforms do not have the same effect at the beginning and at the end of the transition. Fidrmuc (2003) examined transition economies and found that liberalization had a positive effect on economic growth at the beginning of transition, but this effect faded out and nowadays the result is insignificant. Another example is that while the effect of secondary education was insignificant in the first half of transition, due to bad institutions, the second half of transition shows a positive effect.

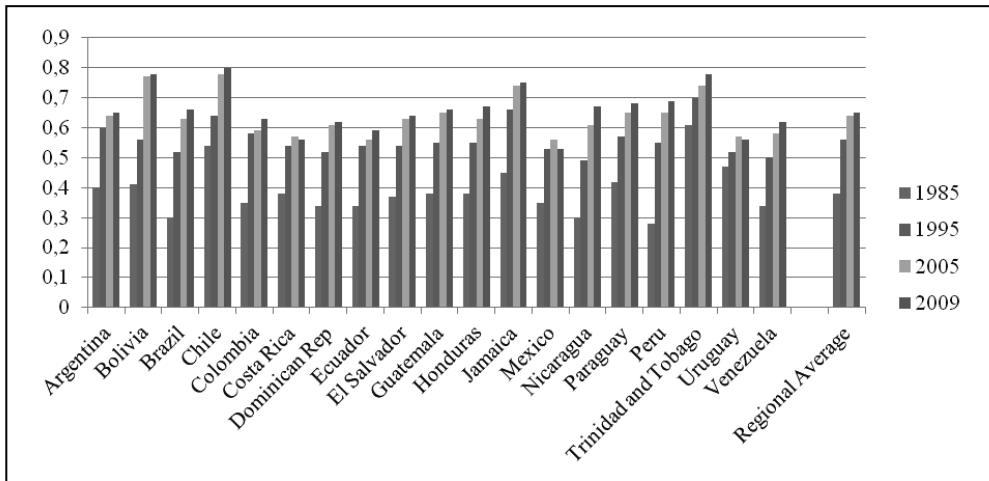
However, one must keep in mind when analysing the relationship between growth and any given factors, that there are a great number of factors which influence economic growth in both positive and negative ways<sup>2</sup>. Moreover, according to the Solow growth model, an underdeveloped country is able to grow faster than an affluent economy, so a persistently low rate of economic growth *per se* should not be interpreted as indicating that the reforms taken were unsuccessful.

With all these taken into consideration, I examined the relationship between the structural index created by Lora (1997) and the economic growth of the Latin American region. The structural reform index was created as a response to the difficulties of assessing the reform processes following the debt crisis in the 1980s. The index measures the neutrality of reform policies – not the quality aspects – in a range from 0 to 1. The structural reform index reflects the evolution of five reform areas: trade policy, financial policy, tax policy, privatizations and labour legislation. The total index of reforms is the simple average of the index of the five areas. In his recent paper, Lora (2012) calculated the structural reform index for 19 Latin American countries for the period 1985-2009. The results are shown in Figure 1.

<sup>2</sup> Sala-i-Martin et al. (2003) found a positive relationship between growth and these variables: primary school enrollment rate, density of population in coastal areas, life expectancy, initial level of per capita GDP, fraction of GDP in mining, number of years an economy has been open, fraction of the Muslim and Buddhist population, fraction of population speaking a foreign language. Negative relationship between growth and these variables: proportion of a country's area in the tropics, index of malaria prevalence, former Spanish colonies, ethnolinguistic fractionalization, share of government consumption in GDP, public investment share, real exchange rate distortions.

Figure 1

### The structural reform index



Source: Lora 2012.

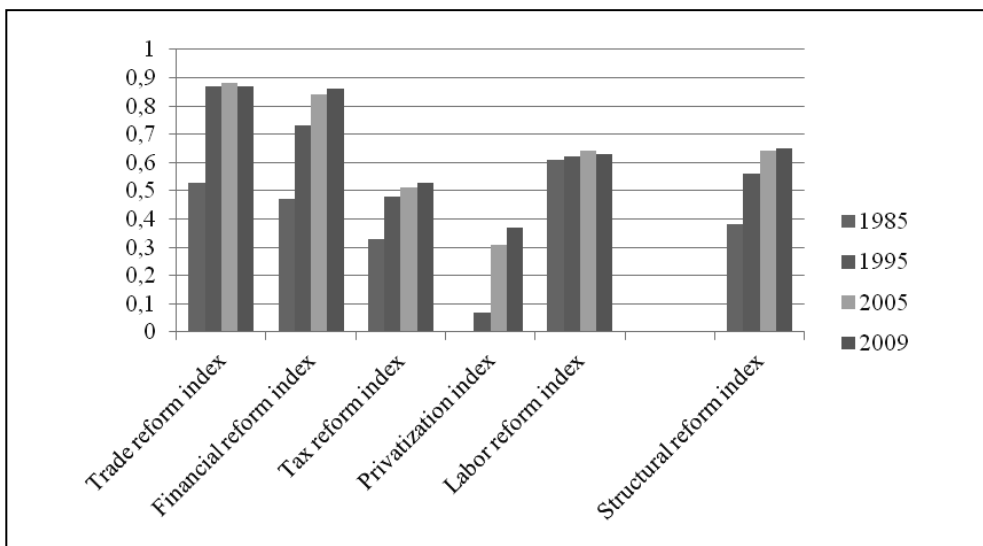
Among the Latin American countries Chile scores the best result in the structural reform index, followed by Trinidad and Tobago and Bolivia, while the worst performing economies regarding the structural policies are, Costa Rica, Uruguay and Mexico (in this order). The reforms taken are not equally divided during the whole period: after a high rate of reforms in the 1980s, the rate of reform implementation slowed down. Moreover, due to the 2008-09 crisis, the level of the reform indexes stagnated in most countries and even decreased in some of them.

The reform process has not been equally divided between the reform areas either. The greatest progress made has been in the areas of trade, financial and labour market reforms, while fewer reforms have been implemented in the areas of tax reform and privatization. As seen in Figure 2, the reform process was very intensive up until 1995; there have been no major changes since then with the exception of the privatization index. Moreover, the regional average of the indexes in the areas of trade and labour market reform showed a decline by 2009, suggesting that the crisis negatively affected these policy areas.

The structural index created by Lora (1997) is now available with data up to 2009, so this gives an opportunity to evaluate the relationship between reforms and economic growth involving a new crisis period that may affect the outcome of the analysis. My main goal here was to answer the question of whether there is a relationship between the level of the structural index during the period of 1985-2009 and the change in GDP per worker from the beginning of the period to the end of the period. In the analysis I included all the 19 Latin American countries discussed by Lora within the period 1985-2009. The structural reform index data are from Lora (2012) and the GDP per worker data are from the Penn World Table (Version 7.1).

Figure 2

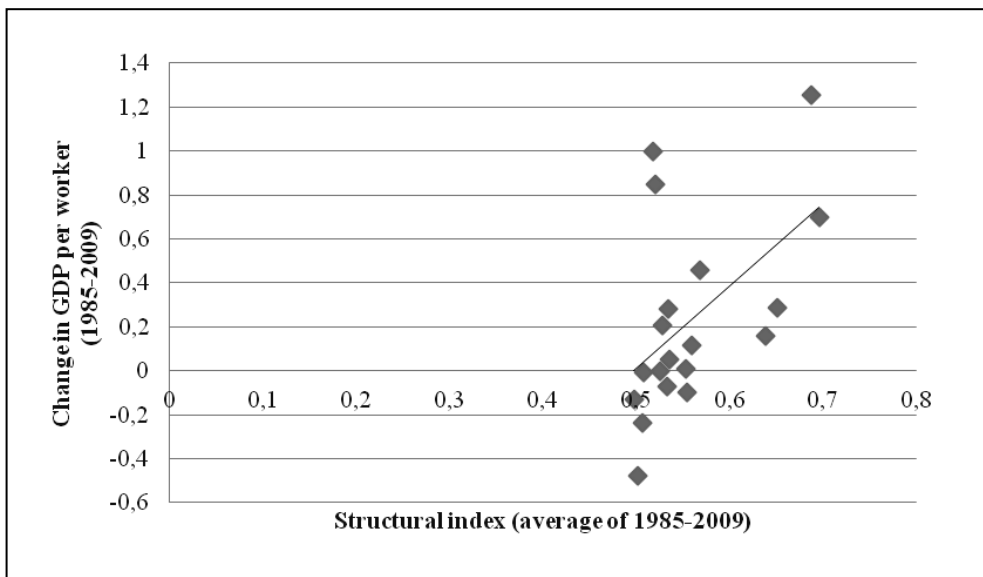
### Reform process in Latin America



Source: Lora 2012.

Figure 3

### The relationship between the structural index and the change in GDP per worker



Source: author's calculations.

As can be seen in Figure 3, I found a positive relationship between the structural reform index and the change in GDP per worker in the period 1985-2009. The data fits an upward slope trend line and the econometric analysis confirms this relationship: the relationship between the reform index and the growth change is significantly positive with a p-value of 0.052. Although the relationship is significantly positive, this does not necessarily mean that the existence of reforms have a positive effect on economic growth. To determine the direction of causality, i.e. whether reforms have a positive effect on growth or vice versa, further analysis is needed.

## **Conclusions**

There is an extensive literature in economics that emphasizes the role of institutions when analysing economic development and from this point of view, Latin America is an important field of research, because there are so many similarities yet so many differences among these countries. Colonization resulted in a centuries-long period of dependency for the Latin American continent, while there was no significant institutional or technological development, which can be seen in the stagnating GDP data for that period. The most important outcome of the colonial era was that by the time of independence – the first half of the nineteenth century – the kind of formal and informal institutions had evolved which became an obstacle to growth and development later on. Due to inappropriate and even absent property rights in the region, Latin America was not able to take part in the industrial revolution as the advanced countries did, but became a raw material supplier for the industrialized countries. This de-industrialization of the continent held back its growth and development even more. Finally, the new constitutions and laws implemented in the Latin American countries, together with the favourable international environment, allowed the continent to grow at its potential growth rate in the second half of the nineteenth century.

In the twentieth century, after the two world wars, inward economic policy spread across Latin America and the high growth rate the continent was experiencing masked the problems behind the import substitution industrialization. High fiscal deficits and debts along with high inflation made these countries vulnerable, and the rise in international interest rates with the collapse of oil prices pulled the trigger, resulting in a decade long stagnation. During the eighties, several attempts were made to stabilize the region and restart growth, but the Latin American countries, as well as Washington, had to admit that there would be no sustainable growth for this region without deep market-friendly reforms. In order to remedy this situation, the Washington Consensus was created by the end of the decade. The Consensus contained recommendations which were conditions of financial help from the IMF to these indebted countries and so a reform era began for the continent. With many reforms implemented and economic growth restarted, economists were hopeful about the future of the continent. However, within six years ten countries experienced a financial crisis which made it clear that further and even deeper reforms were needed. Therefore a modified Washington Consensus was assembled, providing second generation reforms for the region.



After the international turmoil following the dotcom crisis in 2001, the Latin American continent experienced a unique economic boom with an average growth rate of 6.2, which was the result of a prosperous international environment and previously implemented reforms both in monetary and fiscal areas. Moreover, at the beginning of the twenty-first century, implementation of fiscal policies became more widespread across the continent, and have helped the economies to ensure macroeconomic stability. This stable economy was indeed needed in 2008 and 2009 to counterbalance the negative effects of the crisis and to regain significant economic growth. Although the region managed to restart growth at the second half of 2009 and reached a growth level similar to that experienced before the crisis, due to the prolonged crisis in Europe and worsening prospects for the recovery of international trade, the average growth rate in Latin America started to decrease and nowadays further problems appear to have been exposed. Recently, Ernesto Talvi (2013) has written an article regarding the problems the Latin American continent faces, suggesting that without a proper educational reform the continent's economic success is doubtful. When assessed by education surveys, 15-year-old students in Latin America performed below the basic levels in math, science and reading comprehension, which will lead to an uneducated workforce setting back the productivity and therefore the possibilities of these countries.

The Latin American continent has experienced a long and still on-going reform process mainly since the debt crisis in the eighties, and this raises the question of whether these reforms have contributed to economic growth and to what extent. There are numerous papers regarding this question and most of them confirm the hypothesis that there is a positive relationship between growth and reforms. After Lora (2012) released a newer and extended version of the structural reform index, it has become possible to analyse this question in a period containing one additional great crisis, which may affect the outcome of the analysis. I examined 19 Latin American countries in the period of 1985-2009, and found a result consistent with the literature, namely that there is a positive relationship between the structural reform index and the change in GDP per worker, but this result does not say anything about the causality, which is something which requires further analysis.

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## **RTA-Effects in Times of Crisis: The Case of Mercosur**

### **Introduction**

In recent years the process of multilateral decision making has become slower and negotiations come to a halt more frequently, a phenomenon which has resulted in the proliferation of preferential trade agreements. Regional Trade Agreements (RTAs) enable the partners to consider more specific topics, accelerate the momentum of the talks, attract foreign direct investments and have a positive effect on growth. Since economic integration has a favorable effect on the growth of intra-industry trade (IIT), IIT can be used as a proxy for the depth of an RTA and the deeper the integration, the stronger its crisis managing effect can be, at least for as long as the shock is exogenous to the block, i.e. as long as it comes from third economies.

Accordingly, this paper is organized as follows. Firstly, I introduce the current state of the Multilateral Trading System and the main advantages of RTAs. Then I briefly take a look at the formation of Mercosur, the largest Latin American regional integration. Afterwards I present my research and findings on Mercosur's IIT before finally drawing conclusions about the role and effects of RTAs in times of crisis.

### **Multilateral Trading System**

On 31 July, 2013 there were 575 Regional Trade Agreements (RTAs) notified to GATT/WTO out of which 379 were in force (WTO, 2013), (WTO, 2014) (See Appendix 1). This growing number and the share of world trade covered under them is an indicator of the prominence of RTAs in the Multilateral Trading System (MTS); what is more, the almost four hundred regional integrations are often of highly varied content. The fact that both the contents and the regions themselves overlap may cause confusion, unpredictability and unnecessary business costs (Baldwin–Law, 2009), (Ito–

<sup>1</sup> This research was supported by the European Union and the State of Hungary, co-financed by the European Social Fund in the framework of the TÁMOP 4.2.4. A/2-11-1-2012-0001 'National Excellence Program'. The author thanks László Erdey for his valuable comments on the manuscript.

Mashayekhi, 2005)<sup>2</sup>. Countries join one region for one purpose and another region for another purpose (Page, 1995) and thus almost all countries are members of at least one agreement<sup>3</sup>. Consequently the Multilateral Trading System cannot address the new challenges - for example crises - and this erodes its relevance.

In recent years the process of multilateral decision-making has become slower and negotiations come to a halt more frequently. Parallel negotiations at multilateral and regional (sub-regional) level make it more difficult for policymakers to identify the interests and objectives of trade talks, WTO Rounds or other conferences (Ito–Mashayekhi, 2005). The stalling Doha Development Agenda is also indicative of this process. The limited progress in the Doha Round, the lack of agreements at the global level and the permanent stop-start negotiations prevent countries benefitting from the welfare enhancing effects of international trade, the very phenomenon which originally provoked the proliferation of preferential trade agreements. Negotiating on a bilateral or regional level, however, enables them to consider more specific topics and to make progress at a quicker pace. According to a Policy Analysis by the Peterson Institute, the closure of the Doha Round would still lead to a world GDP gain of almost 280-300 billion USD per year (Hufbauer et al., 2010). Although there have been arguments that in the kind of protectionist environment which has developed since the latest financial and economic turmoil, the Doha Round should be dropped completely, the Policy Analysis still argues that Doha is not a lost cause and now it is more important than ever to stick to a rule-based trading system and to put together a balanced (both for developing and developed countries) Doha package. Based on the calculations of Hufbauer–Schott (2013) potential annual global payoffs could be reached in three areas: exports, supported jobs and GDP (see Table 1)

*Table 1*

Agenda topic	Export gains (billion USD)	Export jobs supported (millions)	GDP increase (billion USD)
<b>1. Trade facilitation agreement</b>	1 043	20.6	960
<b>2. International services agreement</b>	1 129	8.6	1 039
<b>3. International digital economy</b>	178	3.7	147
<b>4. Duty-Free Quota-Free market access for LDCs</b>	8	0.746	7
<b>5. Agricultural export subsidies</b>	5	0.142	5
<b>6. Limits on food export controls</b>	n.a.	n.a.	45
<b>7. Environmental goods and services</b>	10	0.3	9
<b>Total</b>	<b>2 374</b>	<b>34.1</b>	<b>2 212</b>

Source: Hufbauer–Schott (2013), p.3.

<sup>2</sup> The reduction of complexity was successful in those areas where full harmonization has been realized. However if overlapping agreements promote different criteria for the harmonization and if initiatives are conducted unilaterally, i.e. in isolation from international institutions, new obstacles may arise (Page, 1995), (Lesser, 2007).

<sup>3</sup> Also known as the Spaghetti Bowl (or sometimes the noodle bowl) of regional trade agreements (Bhagwati, 1995).

The authors find that though most gains would be realized in the developing countries, coming to an agreement regarding agricultural subsidies would also benefit the developed world, as it would somewhat lessen the artificial competitiveness created by export subsidies and make the import of manufactures more desirable through lower tariffs. Prospects seem favourable but some developing countries, led by India, already want to amend the rules by taking the option of a *peace clause* for 3-4 years, which, while still an advance compared to a waiver, is not the ideal precursor of a future closure.

From a historical perspective the speed of regionalism already outperformed multilateral trade talks in the 1990's. As Baldwin (1993) put it, there is a distinct domino effect of signed FTAs, and he appropriately named this the domino theory of regionalism. Many Free or Preferential Trade Agreements, however, are driven at least partly by defensive trade agreements, i.e. agreements are signed in order to decrease the discrimination caused by third nations' FTAs/PTAs. Hufbauer (1989) calls this same phenomenon FTA interdependence or FTA magnetism, while Baldwin and Jaimovich (2012) call it FTA contagion and construct a contagion index to gauge this process.

Feund and Orneals (2010) say that though concerns<sup>4</sup> raised in the last 15 years regarding trade agreements are legitimate, they should not be overemphasized, since governments seem to choose well when it comes to adjusting to trade policies; empirics have also found that cases of trade creation outweigh cases reporting trade diversion. The new and remaining issues which should be considered important are the wide range of implementation rates across sectors and the need for more thorough analyses of the factors behind the benefits which arise from deeper integrations. Baldwin (2011) already writes of a 21<sup>st</sup> century regionalism, some characteristics of which have already materialized, but whose final working frameworks are yet to emerge. Considering the above mentioned points, after the era of New Regionalism we have now arrived at the third wave of regionalism, 21<sup>st</sup> century regionalism in which nations keep joining the WTO but liberalization seems to happen outside its walls.

Skepticism regarding the MTS and the current state of trade talks are manifested in the appealing option of the formation of mega-regionals. According to Baldwin et al. (2013) such mega-regional proposals in the pipeline could include the Trans-Pacific Strategic Economic Partnership, the Transatlantic Trade and Investment Partnership, the Regional Comprehensive Economic Partnership, the Tripartite Free Trade Area and also the Pacific Alliance. On the one hand these region-wide FTAs could, to a certain extent, handle the problem of overlapping agreements and also solve some of the friction arising from the presence of multiple rules of origin, but at the same time they could be detrimental for economies, especially small and open ones, which would be left outside of these agreements. The WTO's regional and global trade governing rule is needed now more than ever and if it requires the creation of a 'WTO 2.0' – as Baldwin (2012) puts it – then so be it. If the world of international commerce has changed, why should the international organization governing it not change as well?

<sup>4</sup> Concerns cover topics such as trade diversion caused by interest groups' impact on the government when deciding on preferential agreements; the stalling of broader trade liberalization or even going into reverse; or the weakening of multilateralism (Feund-Orneals, 2010).

The upcoming Bali conference will, in this sense, be critical in terms of the future of the Multilateral Trading System under the GATT/WTO. Negotiators should drop the all-or-nothing approach and follow, more or less, the agenda outlined by Hufbauer–Schott (2013); however under no circumstances should this be considered as a completed package but instead they should accept a so called Global Recovery Package in which any member can partake or opt out as long as the MFN-clause is observed.

### **Advantages of RTAs**

The best known advantages of RTAs are the static advantages due to trade creation when participants reduce internal trade barriers and so generate new trade. Trade creation promotes trade in services and has an intraregional investment and FDI attracting effect, and thus eventually may have a positive welfare effect (Gaisford–Kendall, 2007).<sup>5</sup> Members of the same RTA can generate additional aggregate demand for each other's products, which is even more important in the case of regional goods and services, which – in times of crises – can be considered as non-tradables (Bevilaqua et al., 2001), (Sosa, 2010). A large share of regional products in trade relations can thus make an economy more vulnerable to regional shocks or to shocks coming from another member state, since the decreasing demand for the products or services cannot be substituted by demand from third countries; the original consumers are not substitutable. If a shock is external to an integration, i.e. it comes from the rest-of-the-world, from outside of the region, then having a common RTA can cushion the effect of the shock on the member states.

Compared to the multilateral level there are fewer participants in a regional (sub-regional) agreement, which means fewer factors have to be considered during decision making, enabling timely and proactive responses to international challenges. Through integrating and liberalizing the markets there is an opportunity to broaden national markets and production scales and in this way improve their competitiveness at a world level<sup>6</sup> (ECLAC, 2010a). It is also commonly known from theories dealing with firm heterogeneity that liberalization of trade flows affects both the extensive (Krugman, 1980) and intensive margin (Melitz, 2003), (Chaney, 2008), (Redding, 2010), (Melitz–Redding, 2012) of trade. Since firms within an industry differ widely in terms of their size and productivity (especially exporters)<sup>7</sup>, in the event of opening up the markets to trade more firms will enter the market for the export profit opportunities, labor will be reallocated from less productive non-exporters to more productive exporters and the least productive non-exporters will eventually exit the market (extensive margin). As factors of production are reallocated towards the most productive firms the increase will be induced endogenously in the aggregate firm (and industry) productivity (intensive margin). In addition, RTAs encourage the formation of regional

<sup>5</sup> However, one should not forget the trade diverting effects of RTAs when imports from a low-cost outside country are replaced by imports from a higher-cost member country because the partner has preferential access to the market without tariff obligations (Gaisford–Kendall, 2007).

<sup>6</sup> Also known as the dynamic advantages of RTAs.

<sup>7</sup> Exporters are different from typical firms as they are larger, more productive and more capital intensive.

value chains, and thus the integration into global value chains, which is a crucial factor when considering competitiveness.

RTAs also contribute to the convergence of standards and disciplines, to cooperation in infrastructure and logistics and to a more transparent, rule-based and predictable legal environment, which obviously facilitates the process of doing business. Participants in a regional agreement have better bargaining power together and thus are able to promote regional interests in global forums with a united position (ECLAC, 2009). According to Ito and Mashayekhi (2005), RTAs may also be considered as a means of testing approaches to new issues before they are applied at the multilateral level and may serve as a lock-in mechanism for political and economic reforms. To consider this more deeply, we can also forecast a more democratic environment inside the RTA, which is then more capable of ensuring peace and stability over time and also preventing future conflicts.

RTAs, especially deeper ones with more solid and transparent institutional frameworks, may attract foreign direct investments which then have a positive effect on growth, even in times of crisis and may contribute to quicker recovery from recessions. Members of deeper RTAs may benefit more from the increasing returns to scale, the enhanced home-market effects and also from non-trade nature advantages which Vinerian<sup>8</sup> economics fails to explain. According to Fernandez-Portes (1998), such non-traditional gains and non-trade motivations behind regional integrations can be: (1) credibility, and through this assistance with the problem of time inconsistency; (2) signaling effects, such as signaling to investors that the investment environment is somewhat (more) liberal, or signaling the prospective competitiveness of certain industries, or the sustainability of the exchange rate, or the future relationship of the partaking governments; (3) enhanced bargaining power, (4) insurance against possible future events and (5) the existence of a coordination device in the form of the agreement.

Duration analysis, which is the most current analytical framework in the literature of international trade theory, investigates export dynamism, i.e. the export survival rates of trade relations. According to Besedeş-Blyde (2010), although Latin-America underperforms most regions under consideration regarding the average duration of trade, the Southern Cone's survival rate proves to be the best in the LAC region.

Furthermore, and particularly from the perspective of the current paper, economic integrations have a favorable effect on the growth of intra-industry trade (IIT), thus IIT can be used as a proxy for the depth of an RTA<sup>9</sup> (Balassa, 1966), (Erdey, 2004), (Brühlhart, 2002, 2009), Balkay-Erdey (2012) and the deeper the integration, the stronger its crisis managing effect can be.

<sup>8</sup> See the seminal work of Viner (1950). Vinerian economics offers a one-size-fits-all explanation for the establishment and proliferation of trade agreements, based mainly on tariffs and tax economics, which in the 21st century seems somewhat obsolete, or at least incomplete.

<sup>9</sup> According to the Smooth Adjustment Hypothesis, intra-industry trade expansion entails lower adjustment costs than inter-industry trade.



## The History of Mercosur

The candidates for membership of Mercosur (Mercado Común del Sur<sup>10</sup>) had to bypass several intermediate steps before they could sign the Treaty of Asunción in 1991 (Manzetti, 1993). According to Manzetti these steps were: (1) a free trade zone with zero trade tariffs and non-tariff barriers, (2) a common external tariff and (3) integrated economies. Regarding these steps, four main periods can be distinguished in which the would-be Mercosur countries were implementing different trade policies in order to reach their goals. Here I rely on Estevadeordal et al.'s (2000) classification i.e.: (i.) pre-1986; (ii.) 1986 to 1988; (iii.) 1988 to 1991; (iv.) 1991 to 1994; (v.) post-1994. In the following points I discuss briefly the most important measures which were undertaken in the above mentioned periods.

(i.) The initial founders – Argentina, Brazil, Paraguay and Uruguay – signed bilateral agreements which provided tariff preferences (MFN tariffs) for lists of products. Thus preferential trade gradually evolved within the framework of the Latin American Integration Association (LAIA<sup>11</sup>).

(ii.) In 1986 Argentina and Brazil agreed to form the Economic Integration and Cooperation Program (PICE) which included industrial cooperation programs and further lists of negotiated products to receive preferential treatment.

(iii.) In 1988 Argentina and Brazil signed the Integration, Cooperation and Development Treaty with the intention of gradually eliminating barriers to trade in goods and services and switching to a common market by 1995. Uruguay submitted its request for participation as well, while Paraguay was invited to join.

(iv.) Finally on March 26, 1991 the four countries signed the Treaty of Asunción and officially established Mercosur. In April they introduced a new tariff structure, the Convertibility Plan (Estevadeordal et al., 2000). The Treaty of Ouro Preto in 1994 established the institutional foundations of the integration. The member states agreed to form a customs union initially, preceding a common market and made exceptions for certain products – for example those of strategic importance – which were exempted from the common tariff regulations<sup>12</sup>.

In 1995 the currency union was realized and the common external tariff (CET) came into force. The *transition schedule* in 1995 prescribed the formation of the common market by 2001; furthermore the sugar and automotive industries were excused from all regulations (Grigoli, 2008).

In 2004 Parlasur, the parliament of Mercosur was established with each member state delegating 18 representatives. The parliament began its formal operation in 2006, and its official operation in 2010. In 2006 the Andean Community<sup>13</sup> and Mercosur accepted each other's members as associate members. In the same year Venezuela submitted its application for full membership although the Paraguayan parliament has not yet ratified the act.<sup>14</sup> After the impeachment of president Fernando Lugo,

<sup>10</sup> The Common Market of the South

<sup>11</sup> Often referred to as ALADI, which is the equivalent in Spanish.

<sup>12</sup> Argentina exempted 223 products, Brazil 29, Paraguay 272 and Uruguay 1018 (Grigoli, 2008).

<sup>13</sup> Formerly known as the Andean Pact. Current members: Bolivia, Colombia, Ecuador and Peru.

<sup>14</sup> Argentina and Uruguay ratified Venezuela's membership in 2008, Brazil in 2009.

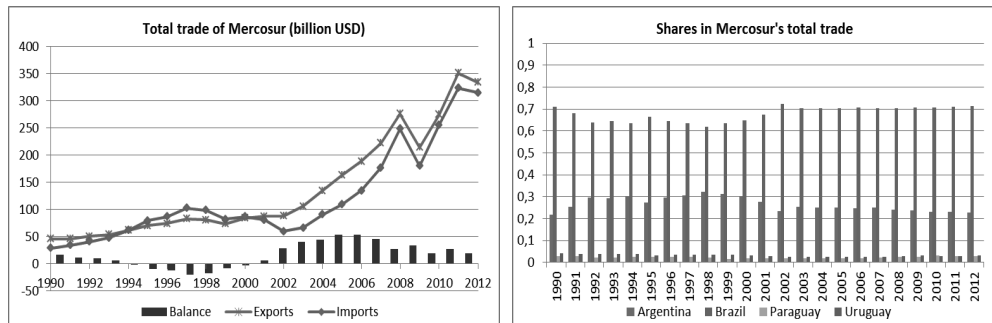
Paraguay was temporarily suspended from Mercosur<sup>15</sup> and with no further impediment to the accession Venezuela was admitted and incorporated into the integration as a full member (effective from 31 July 2012). Since Venezuela's full membership status is legally questionable<sup>16</sup> this paper deals only with the original founding members: Argentina, Brazil, Paraguay and Uruguay.

After this recent political turmoil and hostilities Mercosur was accused of being nothing more than a political club weakened by internal fighting, but in November 2013 Paraguay finally agreed and began to normalize relations with its Latin American companions: Venezuela and Brazil first, and Bolivia a couple of days later (MercoPress, 2013b)

Mercosur now has Bolivia, Chile, Colombia, Ecuador, Guyana, Peru and Suriname as associate members, of whom Bolivia became an accessing member in December 2012. With Guyana and Suriname becoming associates in July 2013, all South American countries are now Mercosur associates (MercoPress, 2013c)<sup>17</sup>.

According to Figure 1, the creation of Mercosur has boosted trade between the founding member states especially after the Argentine, Brazilian and tequila crises in the second part of the 1990's. In terms of the partners' shares in the integration's total trade, Argentina and Brazil - the most relevant countries in terms of size, GDP and trade - account for the major proportion. Brazil takes up about two thirds, Argentina almost one third of total trade.

Figure 1



Source: author's calculations based on UN Comtrade<sup>18</sup>

<sup>15</sup> Suspension was lifted 15 August 2013 when president Horacio Cartes took office as Paraguayan president. (MercoPress, 2013a) <http://en.mercopress.com/2013/08/11/unasur-lifts-suspension-pending-on-paraguay-effective-15-august>, available: 30 October 2013

<sup>16</sup> According to the Charter of Mercosur, a new country's inclusion can only be realized following a consensus, that is if all full members ratify the new member's entry, something which has not yet happened in the case of Venezuela.

<sup>17</sup> <http://en.mercopress.com/2013/07/12/with-guyana-and-suriname-all-south-american-countries-are-merc-sur-associates>, available: 30 October 2013

<sup>18</sup> UN Comtrade Database, DESA/UNSD

## **Intra-industry trade of Mercosur countries**

According to the new trade theories, economic integrations have a favorable effect on the growth of intra-industry trade (IIT), i.e. on the two-way trade in goods with similar production requirements. IIT makes economic structures of member states become more similar and therefore decreases adjustment costs and enhances welfare. Accordingly, IIT can be used as a proxy for the depth of RTAs and the deeper the integration, the stronger its crisis managing effect will be. International statistics show that while the actual crisis was generated in the center economies, the recovery was driven by the emerging ones (ECLAC, 2010b).

### **Data**

In order to measure the effect of deepening integration on intra-industry trade I have conducted a series of calculations regarding the share of IIT in intra-Mercosur trade flows and in trade between Mercosur member states and the rest of the world. I used bilateral trade statistics from the United Nations' Comtrade database and applied two different methods of calculation. (1) In the first case, the data were SITC Rev.1, 3-digit aggregates, covering approximately 180 industries and the analysis encompassed the period between 1962 and 2009. (2) In the second case, data were available from 1993 to 2010 and were HS92, 6-digit aggregates. Because of the chosen level of aggregation the number of industries was significantly higher this time; the calculations covered about 5000 products each year. Horizontal (HIIT) and vertical (VIIT) intra-industry trade<sup>19</sup> between Mercosur countries are both calculated in the second case.

### **Methods**

In the first case, IIT values of both total trade and manufacturing are calculated with the Grubel–Lloyd (GL) index (Grubel and Lloyd, 1975) which is a preferred and commonly accepted index dealing with international trade<sup>20</sup>. In the second case I have also calculated the GL indices but also used the Fontagné–Freudenberg (1997) method which is a quality based methodological approach. By simultaneously examining the export and import of qualitatively differentiated products, it is possible to disentangle vertical IIT (VIIT) from horizontal IIT (HIIT) (Fontagné et al., 2005). Calculations again covered both total trade and manufacturing.

In order to distinguish between one-way trade (OWT) and two-way trade (TWT), and between horizontal IIT (HTWT) and vertical IIT (VTWT), threshold values can be used. For threshold values I chose 10 and 25 percent, respectively. That is, if overlap of export and import was equal to, or more than, 10 percent, both were considered TWT, and if the overlap was less than 10 percent both were considered OWT. In other words, if the value of the minority flow represented at least 10 percent of the majority flow then both were considered TWT. Furthermore, by incorporating price indifferences, that is by setting a 25 percent threshold value I was able to separate HTWT and VTWT.

<sup>19</sup> i.e. trade in similar and qualitatively differentiated products.

<sup>20</sup> For further information on the theoretical and statistical problems of the GL index, see Erdey (2005).

If unit values differed by more than 25 percent the products were considered vertically different, otherwise they were considered horizontally different.

## Results

In the first case the results indicate that between 1962 and 2009 the share of intra-industry trade in total trade was growing almost constantly. Furthermore, the results support the hypothesis of the IIT theory, namely that intra-industry trade is predominant in processing industries. My results are, on average, 10 percentage points higher regarding manufacturing than those regarding all industries. Appendix 1 demonstrates the calculated GL indices in manufacturing when data were SITC Rev. 1, 3-digit aggregates comparing them to the GL indices when data were HS92, 6-digit aggregates. The aggregational bias is clearly visible, the 3-digit aggregate values are on average 30 percentage points higher in the case of the Argentina-Brazil and Argentina-Uruguay trade relations and on average 10 percentage points higher in the case of the smaller countries. Nevertheless, the co-movement of the curves is also visible. The increasing share of IIT due to the creation of Mercosur is best observable in the case of Argentina-Brazil, Argentina-Uruguay<sup>21</sup>, Brazil-Uruguay and Uruguay-Paraguay trade flows.

Appendix 2 shows my results regarding manufacturing when data were HS92, 6-digit aggregates and when I used the Fontagné–Freudenberg method to disentangle vertical and horizontal IIT. According to the figures, TWT is most significant between Argentina-Brazil and Argentina-Uruguay and somewhat significant between Brazil-Uruguay and Uruguay-Paraguay. The pattern clearly shows that when OWT decreased, TWT increased at the same time. This connection is especially well demonstrated regarding the trade relations of Argentina-Uruguay and Uruguay-Paraguay. Uruguay tends to keep close (intra-industry) trade relations with Argentina; however, during the Argentine crisis, when Argentina decreased its imports, Uruguay traded more intensely intra-industry with Paraguay<sup>22</sup>.

Comparing the results to those of the European Union we can state there is a parallel between the growing tendencies, although the IIT is higher in value in the case of the European Union. According to Fontagné et al. (2005), in 2000 there were only three pairs of countries which were non-European considering the worldwide top ten proportions of bilateral IIT<sup>23 24</sup>: Malaysia–Singapore, United States–Canada, Taiwan–Singapore (see Appendix 3).

<sup>21</sup> However, this decreased and then stagnated in the period of the Argentine crisis. This decrease is mirrored in the growing IIT share between Uruguay-Paraguay around the millennium.

<sup>22</sup> The co-movement of business cycles between Argentina and Uruguay is a well observed and empirically described phenomenon. Because of the real and financial linkages in the background there is a very high (but decreasing) correlation between the cyclical components of GDP. An idiosyncratic trade pattern also makes its contributions felt mainly through the following channels: similar commodity export bases, similar exchange rate policies in some periods, large flows of traded goods and services, high shares of regional goods and services (e.g. tourism and connected services or car parts), importance of FDI flows especially in the form of Argentine investments to Uruguayan real estate and the agricultural sector. The Uruguay Central Bank has also been a host for Argentine deposits for a long period. The influence of Brazil, the other “Big Brother” is not negligible either. See e.g. Masoller (1998), Bevilaqua et al. (2001), Sosa (2010).

<sup>23</sup> This corresponds to Boonekamp’s (2003) claim that the greatest concentration of RTAs is in Europe.

<sup>24</sup> For further research in connection with the European intra-industry trade patterns see Brühlhart and Elliott (1998), Fontagné and Freudenberg (2002) and Brühlhart (2009).

ECLAC (2010b) also suggests that the recent recovery from the 2007/08 crisis generated by the centre countries was driven by the emerging economies and by the increasing south-south trade and rising south-south FDI. After a short relapse in trade in 2009 Latin American trade flows recovered, which is especially visible in the case of Mercosur, where exports grew by 29 and 26 percent and imports grew by 43 and 25 percent in 2010 and 2011, respectively. Recovering trade and continuous investment could then imply economic growth, which in most cases was higher than the regional average (see GDP growth for Mercosur countries in Table 2 and investments in Table 3). Considering investments, Mercosur countries – with the exception of Paraguay – performed at least as well as the regional average and in some cases even outperformed the European Union. Deepening and further development of intra-regional trade, also through more intense intra-industry trade, if well exploited, could mean broader intra-regional markets which then help cushion demand shocks originating outside the region.

Table 2

Gross domestic product, constant prices (percentage change)									
Country	2005	2006	2007	2008	2009	2010	2011	2012	2013*
<b>Argentina</b> <sup>25</sup>	9.179	8.466	8.653	6.759	0.850	9.162	8.868	1.900	3.462
<b>Brazil</b>	3.160	3.957	6.091	5.172	0.330	7.534	2.733	0.872	2.537
<b>Paraguay</b>	2.133	4.807	5.422	6.359	3.966	13.093	4.341	1.211	12.000
<b>Uruguay</b>	6.806	4.099	6.542	7.176	2.245	8.947	6.531	3.935	3.509
<b>Latin America and the Caribbean</b>	4.667	5.618	5.743	4.234	1.223	5.994	4.593	2.934	2.681

\*values for 2013 are estimates  
Source: WEO Database (2013)

Table 3

Total investment as percentage of GDP									
Country	2005	2006	2007	2008	2009	2010	2011	2012	2013
<b>Argentina</b>	20.827	22.957	24.123	25.056	21.209	24.432	26.071	23.902	24.247
<b>Brazil</b>	16.206	16.756	18.328	20.694	17.838	20.239	19.726	17.637	19.165
<b>Paraguay</b>	17.017	17.140	15.774	16.404	13.792	16.226	16.207	14.727	16.562
<b>Uruguay</b>	17.699	19.461	19.526	23.208	19.735	18.546	19.375	21.180	19.680
<b>Latin America and the Caribbean</b>	20.386	21.523	22.480	23.652	20.573	21.702	22.223	21.593	22.141
<b>European Union</b>	20.330	21.264	22.143	21.750	18.308	18.719	19.116	18.063	17.663

\*values for 2013 are estimates  
Source: WEO Database (2013)

<sup>25</sup> Note that Argentine GDP statistics are considered inaccurate, or at least should be taken with reservations due to untrustworthy data on the part of the government. The Economist has even stopped reporting Argentine GDP and inflation statistics on their indicators page stating that: "We are tired of being an unwilling party to what appears to be a deliberate attempt to deceive voters and swindle investors." The Economist (2012).

## Conclusions

As its history and trade patterns show Mercosur is gradually climbing the integration ladder and is becoming a deeper integration. After the recent crisis growth performance was uneven in the region, although growth among the member states was above the region's average. In 2010 the whole Latin-American region grew by about 6 percent and Mercosur grew by more than 7.5 percent, which supports the crisis managing effect of RTAs.

IIT pattern, as a proxy for the depth of integration, shows that as a result of Mercosur the structure of the economies of member states have become more similar and involve lower adjustment costs. According to the GL-indices, adjustment costs were lower in the Argentina–Brazil relationship. These findings are in accordance with theory, namely that regional integrations have a favorable effect on the growth of intra-industry trade. Meanwhile, the world of regional trade agreements is undergoing major changes.

The upcoming conference in Bali, in early December 2013, could finally put an end to the so far tortured Doha history and prove the sceptics - who sometimes call Doha “Doha-ha-ha” - wrong. After the 2008 collapse it is very unlikely that the trade talks could be revived again should they once again fail to achieve a completed deal this year. Failure in Bali would mean a complete loss of credibility for the WTO as a multilateral negotiating forum. So, with bated breath all eyes are now on Bali and the WTO.

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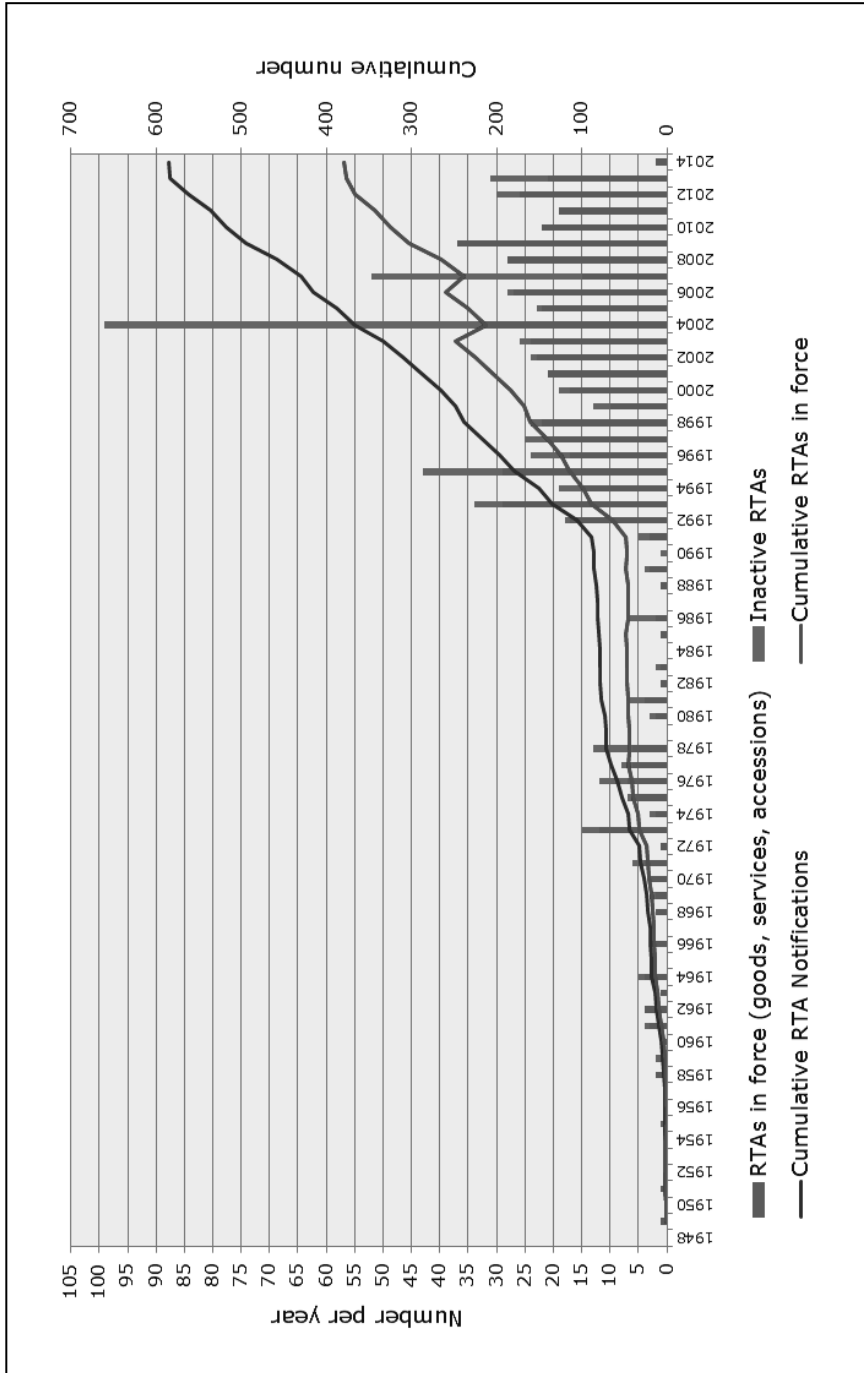
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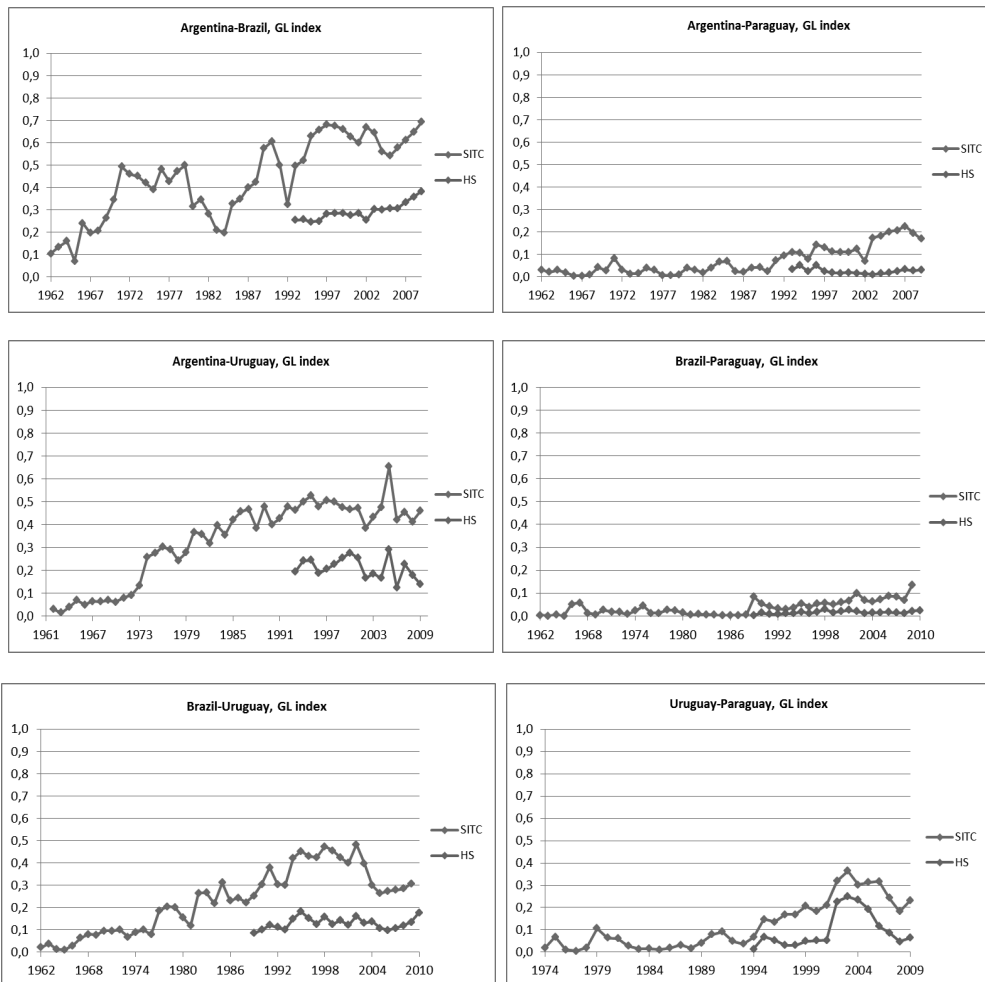


## Appendix 1



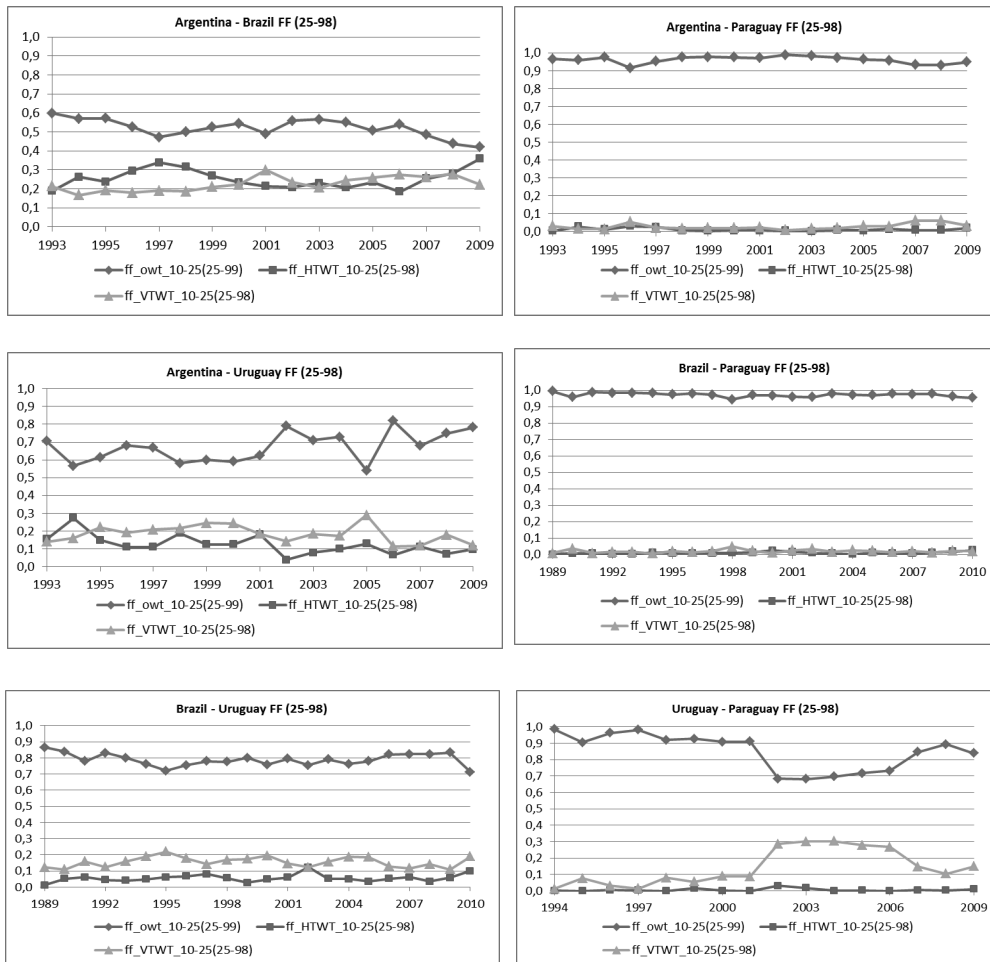
Source: WTO (2014)

## Appendix 2



Source: UN Comtrade, author's calculations

## Appendix 3



Source: UN Comtrade, author's calculations

#### Appendix 4

The worldwide top ten bilateral IIT shares, (percentage in 2000)		
Germany	France	88.70
Malaysia	Singapore	85.69
France	Belgium and Luxembourg	82.47
Netherlands	Belgium and Luxembourg	81.73
Germany	Belgium and Luxembourg	80.60
Germany	United Kingdom	79.78
Germany	Austria	77.86
France	Spain	77.62
United States	Canada	77.55
Taiwan	Singapore	77.29

Source: Fontagné et al. (2005), p. 21

László Erdey

## **Post-Transition Adjustments and Changes in Hungary's Economy from the Perspective of Intra-Industry Trade and Foreign Direct Investment**

International trade and Foreign Direct Investment (FDI) are well documented aspects of international economic activity. This paper aims to demonstrate and analyze the most important trends in Hungary's international economic relations as far as the changes in her international trade orientation, structure, and FDI-flows are concerned. The study examines Hungary's post transition international trade, focusing on intra-industry trade (IIT – simultaneous exports and imports within industries) and using IIT as a measure of the sectoral similarity between the country and her most important trading partners, and as a proxy for factor market adjustment costs. The analysis of the trends, structure, and orientation of inward and outward FDI flows are similarly used.

Hungary is a small open country in the heart of Europe. The country's size determines, and always has determined, her exposure to international diplomatic and, more importantly for our topic, economic relations.

International trade, just like foreign direct investment (FDI), is a well documented aspect of international economic activity. Taking a closer look at the 20<sup>th</sup> century history of the country's foreign trade we can see that there were three important changes in her international orientation, all of which can be closely linked to well-defined historical upheavals.

Research, *inter alia* Köves (2003a), demonstrates that World Wars I and II and the post-socialist transition, which started at the end of the 1980s and the beginning of 1990s, profoundly changed the geographic structure of Hungary's international trade. On the eve of World War I Hungary's most important trading partner was Austria, which was responsible for almost 74 and 72 percent of her exports and imports, respectively. Germany's share was limited to between 7 and 10 percent of all trade flows. After about 25 years, in 1938 Hungary's most important trading partners were Germany

A previous version of this paper was presented at the 2012 ASEES Annual Convention in New Orleans. The financial support from the Doctoral School of Economics, University of Debrecen for the author's participation at ASEES Annual Convention is highly appreciated.

and its allies, Italy and Austria, with 47 and 53 percent shares in the country's imports and exports, of which Germany's respective shares accounted for 30 and 27 percent. The era after World War II was dominated by the Soviet Union, not just politically, but in the trade landscape, as well. Its share in Hungary's trade increased very rapidly after the war to between one fifth and one fourth of all international commercial flows and this share more or less survived until the beginning of the 1990s, with about the same proportion as other Eastern-European COMECON countries.

Long run time series of trade activity show a steady growth in external trade volumes (Figure 1). Exports and imports doubled from 1960 to 1967-1968. By the beginning of the transition, imports were five times and exports eight times higher than the base level of 1960. From the middle of the 1990s we can witness an era characterized by very dynamically increasing trade volumes reaching volumes of imports and exports 300 and more than 500 times higher, respectively, than in 1960, with only two shortfalls in 2004 and 2009. The former shortfall might be partly due to methodological changes and the second obviously emerged as an impact of the financial crisis<sup>1</sup>.

In spite of increasing trade volumes, Hungary's trade openness (exports/GDP, imports/GDP or trade turnover/GDP ratios) indices decreased slightly from the middle of the 1970s until the beginning of the period of high trade dynamism starting in the middle of the 1990s (Figure 2). Merchandise trade (as a percentage of GDP) was 82% and shrinking until 1993, and only exceeded its starting level in 1997. From that time onwards, the dynamism seemed almost unstoppable, reaching 153% by 2011, making Hungary one of the most open countries in the world economy. If we take the average of exports and imports of goods as a percentage of GDP, which was 61.1% in 2009 (Figure 3), we can see that in the group of OECD developed countries only the Slovak Republic was more open (62.5%) on the basis of this measure. The OECD average was much lower, at 31.0%. The difference is even higher when comparing Hungary to the largest economies in the world: Germany – 31.3%, China – 21.6%, United Kingdom – 19.3%, Japan – 10.4% and the United States – 9.8%.

The last 20 years has deeply changed the geographical structure of Hungary's foreign trade as well. Taking a snapshot of the geographical structure of Hungary's external trade in 1989 using data from Köves (2003b)<sup>2</sup>, we can see the following country shares in her exports (imports in parenthesis): the Soviet Union – 25.1% (22.1%), Federal Republic of Germany – 11.9% (16%), German Democratic Republic – 5.4% (6.2%), Poland 3.2% (3.3%), Czechoslovakia 5.1% (5.2%), Yugoslavia and Albania 4.2% (3.6%), Austria 6.5% (8.6%), Italy 4.7% (7.3%). Only a little more than a decade after this, in 2002, the export share of the states of the former Soviet Union (Russia and the Commonwealth of Independent States – CIS) was no more than 3.7% and the import share - because of Hungary's high dependence on imported fuels (and to a lesser extent minerals) - was 13.8%. At the same time Germany's shares had increased to 35.5% and 24.3%.

<sup>1</sup> As far as trade data reported by the Hungarian Central Statistical Office is concerned, it must be noted that there were two important changes in the compilation of external trade data. Since the 1997 review, trade between industrial free zones and foreign markets has been taken into account. Since 2004 the compilation has been adapted to the methodology of the EU. See <http://www.ksh.hu/docs/eng/modsz/modsz35.html>, accessed 02/11/2012.

<sup>2</sup> Tables 1 (p. 766) and 2 (p. 767)

After the reorientations following WWI and WWII, the political transition has brought the third wave of very rapid changes in Hungary's trade characteristics. Foreign economic liberalization was very fast and deep<sup>3</sup>, creating the basis for today's trade and foreign direct investment (FDI) structure. The reorientation of trade was greatly facilitated by the Europe Agreement – removing protectionist measures for most of Hungary's trade with the EC (EU) – and the creation of the Central European Free Trade Agreement. The turn towards developed markets at the same time was forced by the transformational recession and the liberalization of the former socialist countries, which significantly decreased the demand for imported products and so for imported Hungarian products.

This third reorientation can be assessed as an undoubted success. The liberal policies towards foreign direct investment linked the country to the global production system of multinational companies. The shifting geographical structure of trade reflects these changes. Between 1991 and 2003 (Figures 4a, and 4b) the share of developing countries in Hungarian exports and imports quickly reached 70% and 80% respectively, while that of Central and East European countries declined from 25% to 15-17%. At the same time, the EU (at first 12 and then, from 1995, 15 countries) became the most important trading partner, dominating Hungarian trade flow destinations and sources from 1995 with a value of 55% and 74% respectively at the end of this period.

Between 2003 and 2006 (Figures 5a and 5b) the share of the EU-25 (the 25 countries constituting the EU from 2004 to 2007) slightly decreased from 76% to 68% in imports and from 81% to 74% in exports, accompanied by a growing share for extra-EU, mostly Asian, countries (the growth of China's share was more than twofold).

The latest period, between 2007 and 2011, is characterized by the stable high share of the EU-27 (with Bulgaria and Romania joining in 2007) accounting for around two thirds of imports and three quarters of exports, with a slightly decreasing role for the core-EU members (the EU-15 of 1995) (from 56% to 51% of imports and from 60% to 54% of exports) and the growing share of the newly joined member states (the EU-12 of the 2004 and 2007 enlargements) and Asia.

Taking a look at the country level (Table 1), Germany's role is unquestionably dominant once again after the interbellum period in the history of foreign economic relations. Germany is responsible for roughly one quarter of the Hungarian trade turnover.

The commodity structure of trade reflects a developed country setup. In the COMECON division of labor system, Hungary was an important exporter of manufactured goods and machinery, but this meant relatively low quality goods exported mostly to the Soviet Union, which in return was the largest supplier of fuels, minerals and other crude materials.

Today, once again, the most important commodity groups in both imports and exports (Figures 6a and 6b) are machinery and transport equipment (46% and 57% respectively in 2011), and manufactured goods (33% and 29%). The difference this time is that the Hungarian products are sold in competitive markets in developed countries. On the import side, fuels and electric energy are significant, as well (12%).

<sup>3</sup> See, for example, Bock (1995), Nagy (1995) and WTO (1998).

The inward foreign direct investment (FDI) of the 1990s and 2000s had a significant impact on the structure of the Hungarian economy; thus it also played a major role in forming the previously analyzed features of external trade.<sup>4</sup>

Although since the first half of 1970s it has been legal to establish international joint ventures in Hungary, the real liberalization of FDI imports started in 1989. The country was the first in the region to open its economy to operating capital. The most important form of inward FDI (IFDI) until 1996-1997 was privatization. Subsequently, greenfield investments and other forms of mergers and acquisitions have been dominant. From the middle of the 1990s Hungary was able to attract about 3.4 billion Euros of inward FDI on a yearly average, of which equity capital is the most important component, with significant flows of reinvested earnings since 1997 (Figure 7). The total stock of IFDI reached 64.7 billion Euros by the end of 2011 (Figure 8). 80.7 percent of the FDI stock at the end of 2011 came from Europe, of which 29.7% was from Germany, 17.7% from the Netherlands and 12.1% from Austria (Table 2a). 77% of this stock was concentrated in services, and 15% in manufacturing (Figure 9).

The country started a new phase of her investment development path in 1997 with the emergence of outward foreign direct investment (OFDI) activities. The development was dynamic, and peak levels were reached in 2006 and 2011 with more than 3 billion Euros per year (Figure 10). The OFDI stock was 18.5 billion Euros at the end of 2011 (Figure 11a). The leading destinations (Table 2b) were Europe with 62.52% (Croatia—15.71%, Slovakia—8.6%, Switzerland—5.88%) and Central America with 26.11% (this high share most probably resulted from asset management activities). Top sectors for OFDI were services (59%), manufacturing (19%) and mining and quarrying (19%) (Figure 11b).

The United Nations Conference on Trade and Development (UNCTAD) introduced its FDI Contribution Index in 2012 (UNCTAD, 2012). The index ranks economies on the basis of the significance of FDI and foreign affiliates in their economy, using the most important indicators (value added, employment, wages, tax receipts, exports, research and development expenditures, and capital formation) of the economic impact of foreign direct investment. According to this index, in 2011 Hungary ranked first as the host economy with the largest contribution made by FDI, followed by Belgium and the Czech Republic (UNCTAD, 2012, p. 197).

An important goal of this paper to clarify whether these significant changes in the country's foreign trade and FDI structures, which linked her deeply to the global production system of multinational companies, made her trade patterns more similar to those of developed countries. Another aim is to assess the adjustment costs arising from the changing characteristics of external trade. The concept and measures of intra-industry trade are used to answer these questions.

Nowadays trade theorists accept as a stylized fact that the analysis of intra-industry trade (IIT) flows (i.e. two-way trade in goods belonging to the same industry) is an important tool in characterizing a country's integration into the world economy. The wide choice of various indices of IIT effectively grab the demand and supply side of international integration; moreover, the marginal indices are good ways of demonstrating changes in these processes and assessing their adjustment costs.

<sup>4</sup> See, for example, Antalóczy—Éltető (2002) Éltető (1999), (2003), Katona (2006), Szanyi (2007).



The final section of this paper intends to analyze some major characteristics of Hungary's IIT after the transition. The time horizon starts in 1992 and ends in 2011. The source of the data was UN's Comtrade database<sup>5</sup>.

Firstly, I calculated the well-known Grubel—Lloyd (1975) indices of IIT (see equation 1 in the mathematical appendix, henceforth Eq1/) for Hungary with its all trading partners, taking them as one country (World), and the same indices for Hungarian—German bilateral trade flows. Although the indices with the World are partly overestimated because of the geographical bias (i.e. different partner countries are grouped together before doing the calculations) they are still appropriate indicators of economic similarity. As the data demonstrate, most of Hungary's trade flows from or to developed countries. The existence of intra-industry (or as it is also generally labeled two-way) trade means that the same or similar products are produced and traded in Hungary as in her (mostly developed) trading partner countries. So, higher IIT-indices mean higher sectoral similarity with these trading partners.

The Grubel—Lloyd indices were calculated at two different aggregation levels:

i) using SITC Rev 1. 3-digit levels (about 180 product groups) for sections 0-9 (all sections), for sections 0-8 (excluding the high trade volatility commodities and transactions not classified according to kind) and for sections 5-8, which is manufacturing<sup>6</sup>. This aggregation level provides possibilities of comparing the results with those of other studies in the field, and

ii) at HS92 6-digit levels (about 4900 products, see tables 3-6 for details) to avoid or reduce the aggregation bias observed at lower levels of disaggregation which are the result of grouping substantially different activities under the same industry heading.

The results are quite obvious: for the Hungary—World trade relation (Table 3, Figure 12) 3-digit GL indices went up from 0.55 in 1992 to 0.77 by 2007 and subsequently fell a little to 0.74 by 2011. Respective values are 0.65, 0.79 and 0.78 for manufacturing as the most important commodity group. Deeper, 6 digit data reflect the same changes, although evidently at a lower level (0.33—0.53—0.51, and 0.36—0.50—0.50 for industry in the years 1993, 2007 and 2011). The GL indices demonstrate evidence for a growing economic similarity to its trading partners. The GL indices regarding bilateral flows with the most important trading partner, Germany (Table 5, Figure 13), show a very similar pattern: 3 digit indices went up from 0.48 in 1992 to 0.74 in 2006 and 2008, then slightly decreased to 0.68 in 2011 (0.53, 0.75 and 0.69 for manufacturing), while 6-digit indices behaved the same way, going up from 0.27 in 1992 to 0.42 for 2008 and decreasing to 0.40 by 2011 (0.30—0.37—0.40 for industry). We can conclude that sectoral similarity with Germany grew significantly during the observed period.

IIT itself can be divided into two parts. Horizontal IIT is the two-way trade in horizontally differentiated products (i.e. similar product versions that are differentiated by secondary attributes but not quality and price) while vertical IIT is that of vertically differentiated products (i.e. product versions differing in quality and so in price). Thus, as a next step I calculated the horizontal IIT (HIIT) and vertical IIT (VIIT) indices using different methods offered by the literature using the Fontagné—Freudenberg—Gaulier

<sup>5</sup> United Nation's Comtrade Database, DESA/UNSD.

<sup>6</sup> Theory and empirical research show that IIT predominantly exists in manufacturing.

(2005) method (FF) /Eq4-6/ with  $\gamma=10\%$  and  $\alpha=25\%$  parameters (Figures 14 and 15), and using the Azhar–Elliott (2004) (AE) geometrical method AE ( $\gamma=10\%$ , and  $\alpha=15$ ) /Eq7/.

Both methods show the prevalence of two-way trade by the end of the period. One-way trade with the world (Table 4, Figure 16) goes down from 0.48 in 1993 to 0.17 by 2011, and from 0.55 to 0.36 with Germany (Table 6, Figure 17) in accordance with the previously analyzed GL indices. The growth of horizontal two-way trade with the World from 0.20 to 0.49 (and 0.10 to 0.25 in the case of trade with Germany)<sup>7</sup> shows that consumption patterns became more similar to those of trading partners and most probably reflect agglomeration and economies of scale effects in the supply side. The stable share of VIIT, in both relations with growing high-quality VIIT and falling low quality VIIT, is in accordance with the quality upgrading of the Hungarian export production sectors with the active role of multinational companies.

In order to estimate the trade induced adjustment costs the closing part of this paper deals with marginal intra-industry trade (MIIT). The relationship between MIIT and adjustment costs is not perfectly elaborated theoretically, but empirical research in this field<sup>8</sup> shows that it is plausible to suppose its existence. The smooth adjustment hypothesis (SAH) states that if changes in trade structure and volumes results in the growth of IIT, then adjustment costs tend to be lower because the reallocation of the factors of production (e.g. labor and capital) happens within sectors and not between sectors. MIIT indices are appropriate tools to grab the dynamics of intra-industry trade (i.e. matched trade changes). I calculated the Shelburne (2004), Brühlhart (1994) A /Eq8-10/ B and the Azhar-Elliott (2003) indices /Eq11/ of MIIT<sup>9</sup>. Export and import price indices were calculated from the WB WDI database.

The Brühlhart A indices of MIIT with the World (Table 3 and Figure 18), on the basis of the smooth adjustment hypothesis, show moderate adjustment costs with shocks in 1996, 2001, 2005, and 2008. MIIT indices of bilateral trade with Germany (Table 5 and Figure 19) are lower, referring to higher adjustment costs, and shocks in 1995-1996, 2001-2005 and 2008.

The shocks of 1995-1996 can be explained by the Hungarian austerity package of March 1995 with several measures introduced in the country's international economic relations. The data for 2001 reflects well the fall in world trade and slower growth of world GDP, and that for 2008 the start of the financial crisis.

We can conclude that Hungary's trade structure became more similar to her developed trading partners with moderate adjustment costs, interrupted by shocks originating from the domestic economy (1995) and from the fluctuations in the world economy (2001 and 2008).

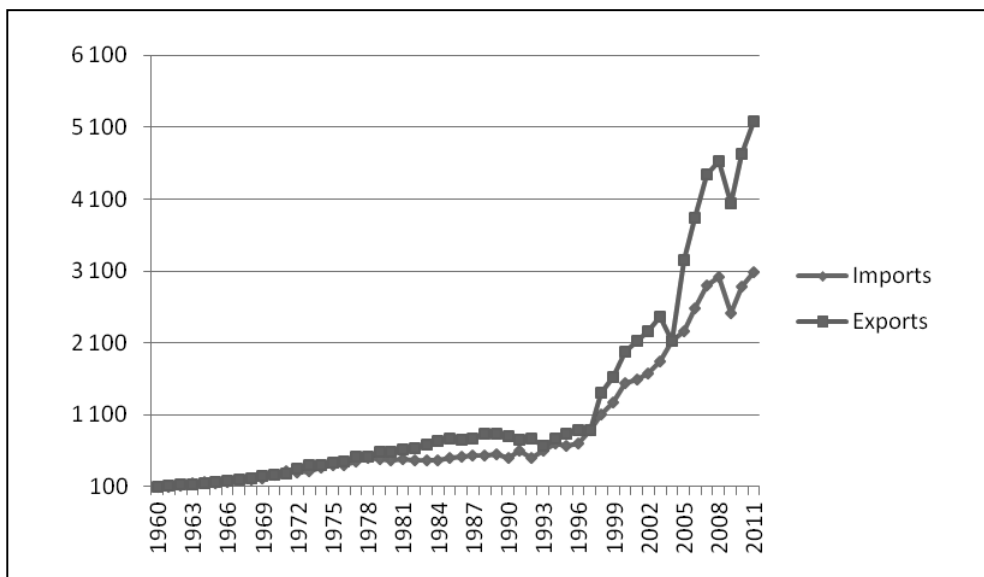
<sup>7</sup> Using data from the AE-method. OWT: one-way trade, HTWT: horizontal two-way trade, VTWT: vertical two-way trade, VLTWT: low-quality vertical two-way trade, VHTWT: high-quality vertical two-way trade, NS: not specified.

<sup>8</sup> See e.g. Brühlhart–Elliott (1998), Lovely–Nelson (2002), and Brühlhart–Murphy–Strobl (2004).

<sup>9</sup> Brühlhart's B and Azhar–Elliott's sectoral indices are not reported in this paper but can be obtained upon request by e-mail from the author.

Figure 1

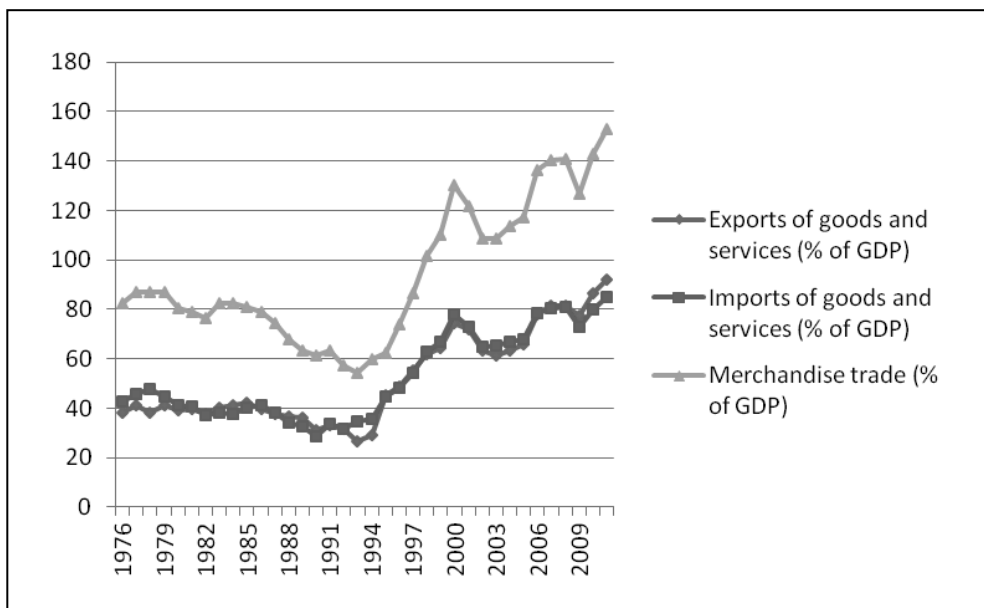
**Volume indices of Hungary's merchandise trade, 1960-2011 (1960=100)**



Source: Hungarian Central Statistical Office (HCSO)

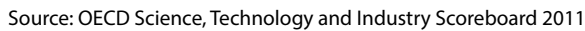
Figure 2

**Indices of Hungary's trade openness, 1976-2011 (%)**



Source: World Bank, World Development Indicators

**Average of exports and imports of goods as a percentage of GDP, 2000, 2008 and 2009**



### Hungarian imports by groups of countries, 1991-2003 (%)

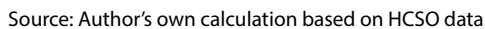
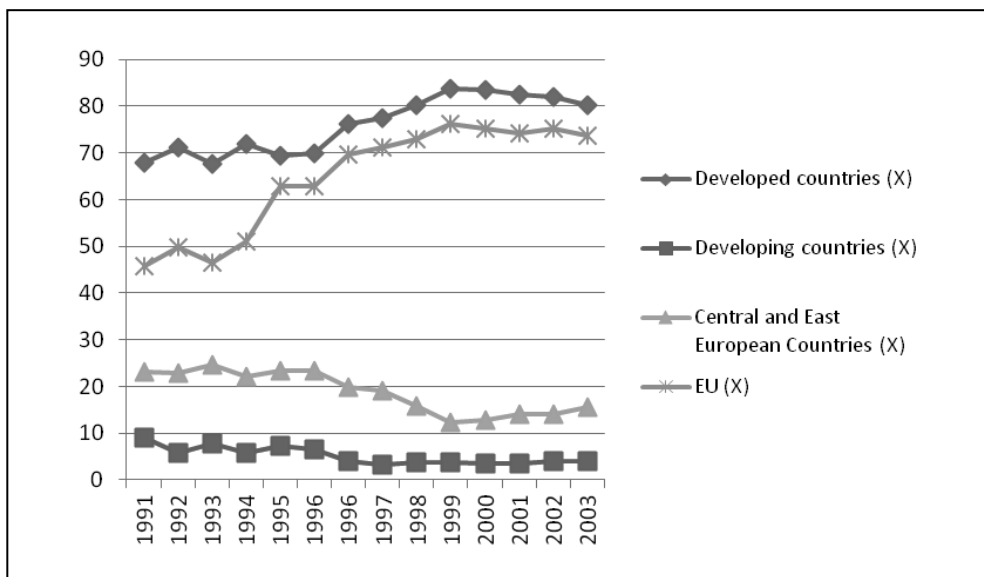


Figure 4b

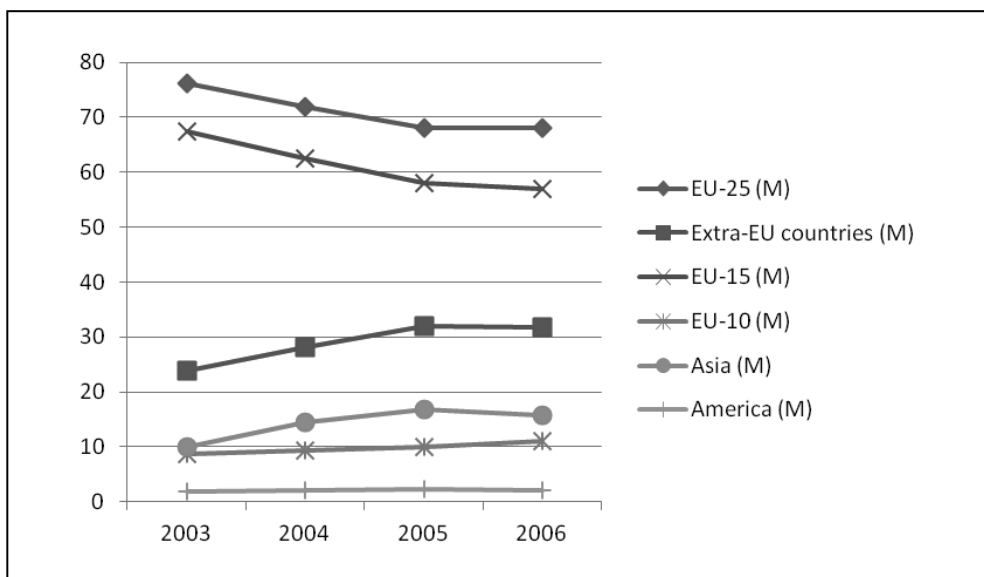
### Hungarian exports by groups of countries, 1991-2003 (%)



Source: Author's own calculation based on HCSO data

Figure 5a

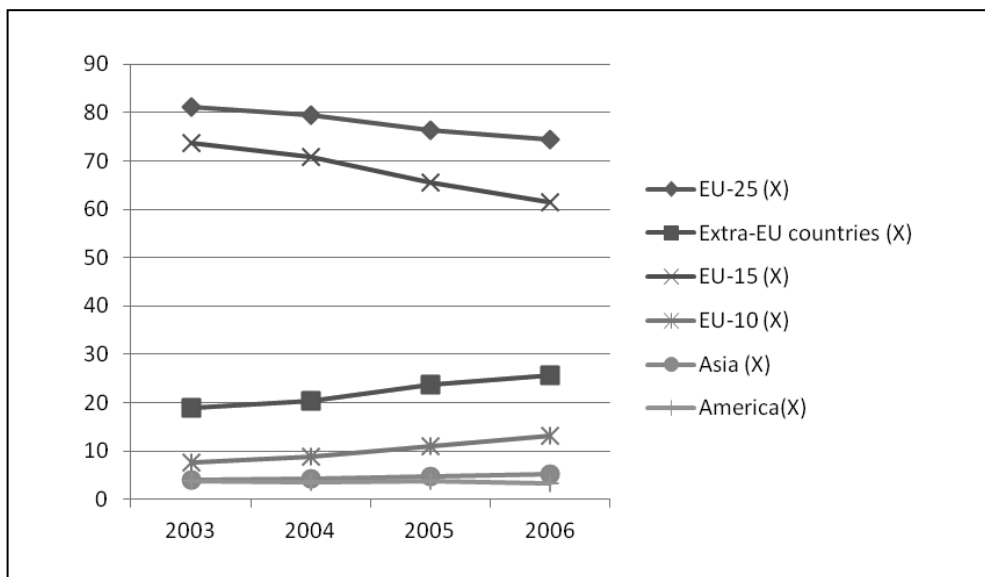
### Hungarian imports by groups of countries, 2003-2006 (%)



Source: Author's own calculation based on HCSO data

Figure 5b

**Hungarian exports by groups of countries, 2003-2006 (%)**



Source: Author's own calculation based on HCSO data

Table 1

**The top 15 trading partners of Hungary, 2001-2011<sup>10</sup>**

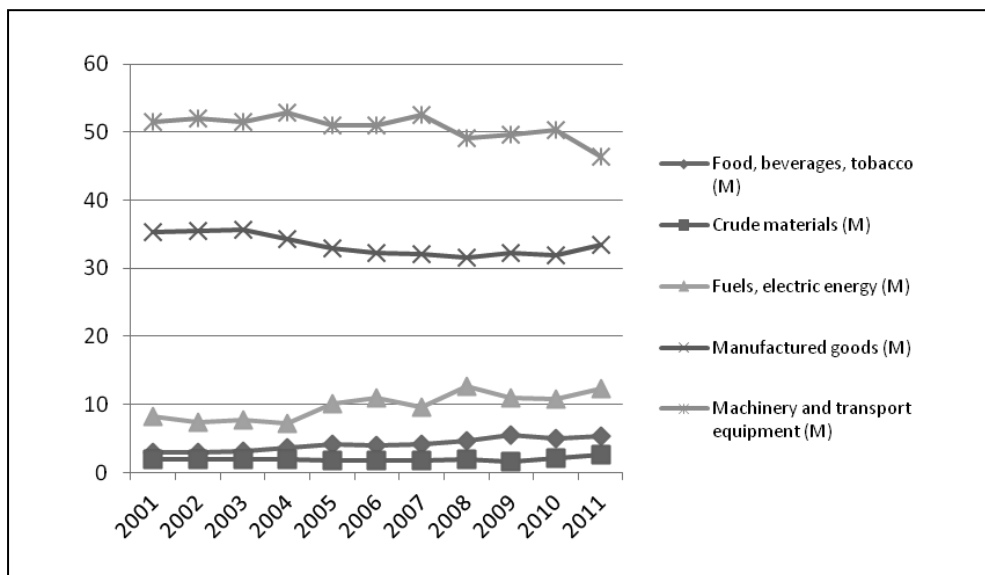
Country	2001	2002	2003	2003	2004	2005	2006	2007	2008	2009	2010	2011
<b>Share in total imports (%)</b>												
Germany	24,91	24,27	24,50	29,88	29,30	27,65	27,28	26,81	25,46	24,80	23,99	23,83
Russia	7,03	6,06	6,22	6,02	5,65	7,38	8,10	6,88	9,29	7,30	7,81	8,74
Austria	7,38	6,93	6,27	11,91	8,15	6,61	6,24	6,09	6,19	6,50	6,19	6,59
China	3,95	5,53	6,90	2,17	4,77	5,40	5,04	5,43	5,68	6,45	7,07	6,02
Slovakia	1,79	1,81	1,95	1,91	1,99	2,27	2,74	3,04	3,54	4,20	4,15	5,43
Poland	2,31	2,52	2,77	2,82	3,21	3,81	4,30	3,96	3,96	4,08	5,27	4,64
Italy	7,87	7,54	7,06	6,37	5,60	4,87	4,61	4,48	4,22	4,14	4,28	4,49
The Netherlands	2,08	2,09	2,15	4,59	4,92	4,36	4,34	4,33	4,55	4,73	4,52	4,18
France	4,69	4,82	4,80	4,28	4,60	4,95	4,76	4,37	4,35	4,39	3,70	3,64
Czech Republic	2,12	2,31	2,41	2,58	2,85	2,87	3,11	3,56	3,78	3,38	3,24	3,43
Romania	1,08	1,14	1,26	1,34	1,51	1,68	2,25	2,18	2,15	2,34	2,61	3,20
Belgium	2,28	1,91	1,76	2,54	2,07	2,23	2,08	2,00	2,32	2,40	2,21	2,10
United Kingdom	2,95	2,84	2,71	2,77	2,68	2,49	2,44	2,50	1,97	1,97	1,88	2,04
United States	4,23	3,70	3,21	1,29	1,65	1,68	1,69	1,63	1,82	2,00	1,80	1,92
Japan	4,63	4,17	4,23	2,54	3,03	3,40	2,88	2,81	2,59	2,52	2,17	1,56
Country	2001	2002	2003	2003	2004	2005	2006	2007	2008	2009	2010	2011
<b>Share in total exports (%)</b>												
Germany	35,61	35,50	33,94	33,94	31,63	30,09	29,47	28,37	26,63	25,56	25,10	24,75
Romania	2,51	2,27	2,60	2,60	3,16	3,74	4,03	4,43	5,32	5,26	5,39	6,09
Slovakia	1,35	1,44	1,97	1,97	1,93	2,86	3,89	4,19	4,75	4,98	5,35	5,87
Austria	7,92	7,08	8,11	8,11	7,25	5,59	4,84	4,52	4,90	4,55	4,90	5,64
Italy	6,25	5,77	5,81	5,81	5,49	5,52	5,46	5,56	5,33	5,73	5,53	4,99
France	5,97	5,67	5,75	5,75	5,57	5,12	4,67	4,73	4,71	5,44	5,00	4,66
United Kingdom	4,30	4,69	4,58	4,58	5,57	5,08	4,48	4,51	4,69	5,30	5,44	4,58
Poland	2,00	2,12	2,27	2,27	2,86	3,24	4,06	4,17	3,95	3,70	3,68	3,84
Czech Republic	1,82	1,89	2,06	2,06	2,37	3,06	3,39	3,77	4,00	3,26	3,46	3,72
Russia	1,55	1,32	1,52	1,52	1,65	1,88	2,71	3,14	3,59	3,56	3,58	3,21
Spain	2,06	2,38	2,73	2,73	2,79	3,22	3,39	3,12	2,78	3,37	3,18	2,63
The Netherlands	4,60	4,26	4,10	4,10	3,66	3,87	3,07	2,92	2,88	3,71	3,16	2,49
United States	4,98	3,49	3,14	3,14	2,99	3,03	2,75	2,34	2,29	2,29	2,04	2,05
Ukraine	0,69	0,80	1,03	1,03	1,11	1,32	1,75	1,94	1,99	1,51	2,04	2,04
Belgium	3,28	2,70	2,30	2,30	2,22	2,12	1,94	1,55	1,69	1,75	1,50	1,42

Source: Author's own compilation based on HCSO data

<sup>10</sup> The ranks are based on total exports to and imports from the partner country in the observed period.

Figure 6a

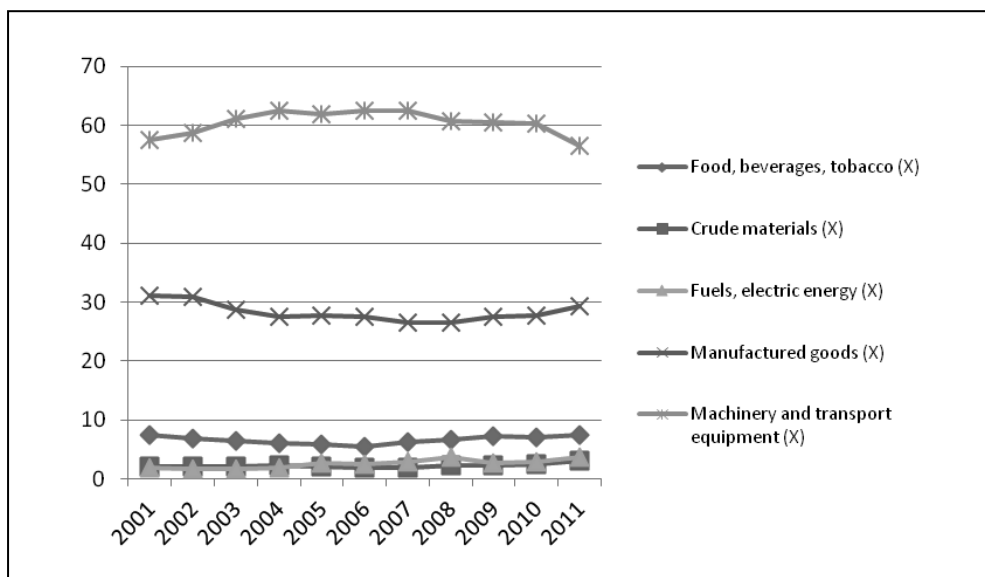
### Commodity pattern of Hungarian imports, 2001-2011 (%)



Source: Author's calculations based on HCSO data

Figure 6b

### Commodity pattern of Hungarian exports, 2001-2011 (%)

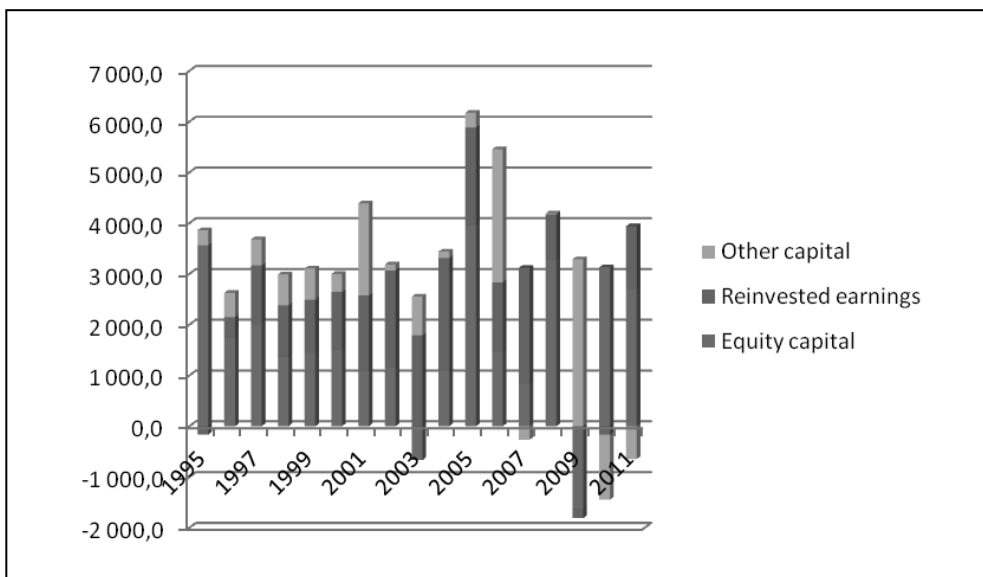


Source: Author's calculations based on HCSO data



Figure 7

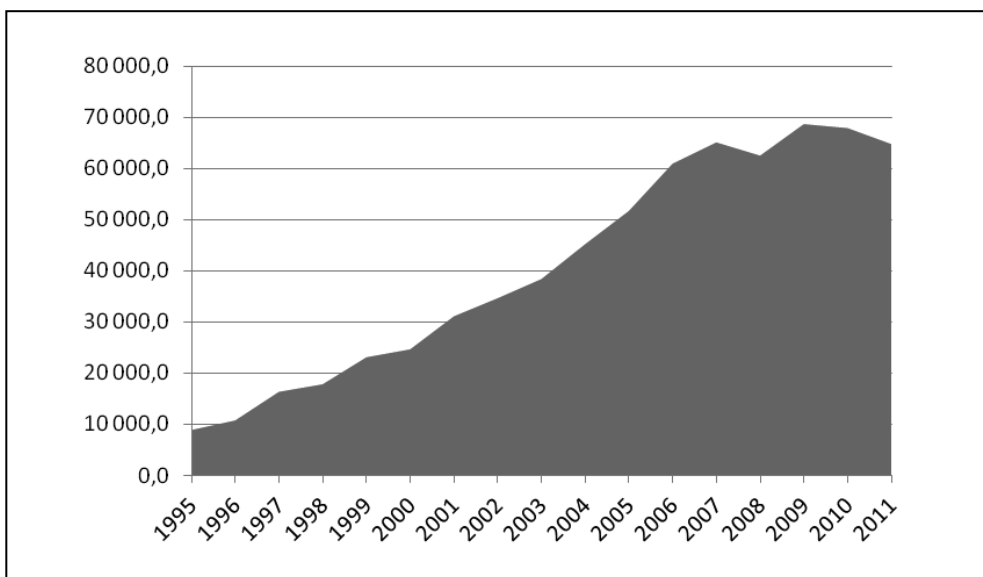
**Inward foreign direct investments in Hungary, 1995-2011 (million Euros)**



Source: Magyar Nemzeti Bank (Hungarian National Bank – MNB)

Figure 8

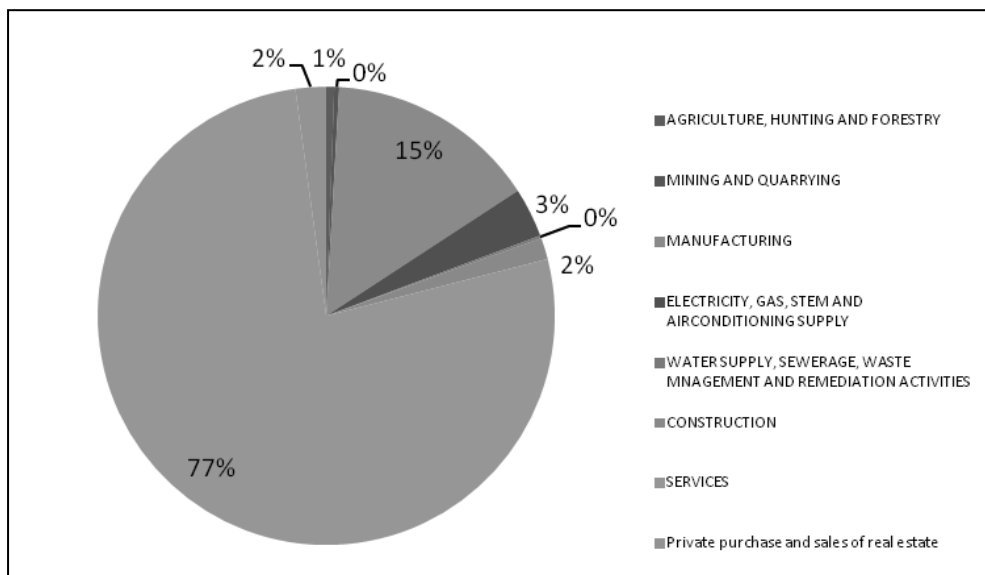
**Stock of inward foreign direct investments in Hungary, 1995-2011 (million Euros)**



Source: MNB

Figure 9

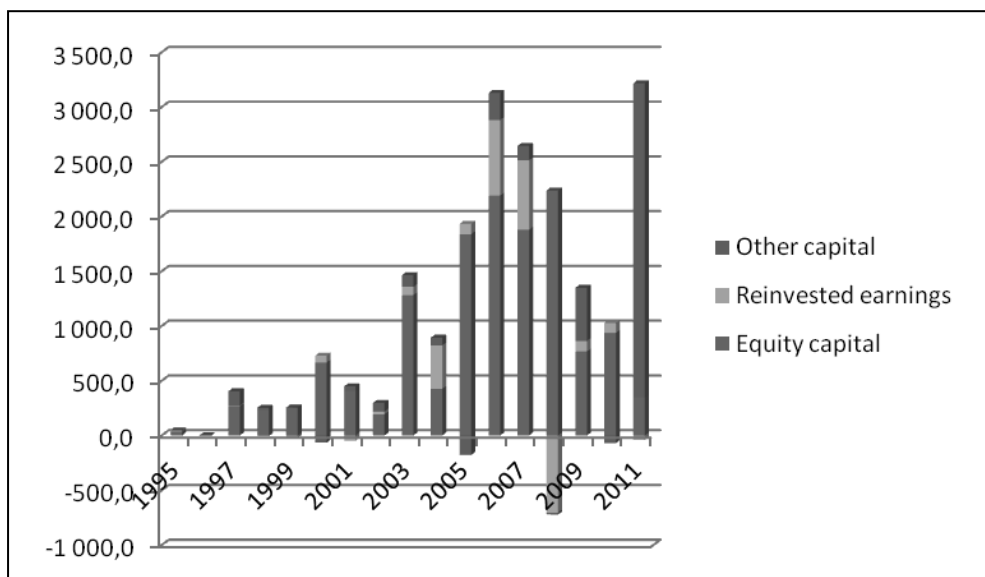
### FDI stocks in Hungary by economic activities, 2011



Source: Author's calculations based on MNB data

Figure 10

### Hungary's outward foreign direct investments, 1995-2011 (million Euros)



Source: MNB

Tables 2a and 2b

## FDI stocks in Hungary broken down by the investors' country, 2011

Euro million						
The investors' country	Equity capital and reinvested	Other capital			Direct investment in	% share in IFDI
		Liabilities, net	Assets, net	Net liabilities		
	(5)=(3)+(4)	(6)	(7)	(8)=(6)-(7)	(9)=(5)+(8)	
Europe	46 444,3	24 950,5	- 19 173,3	5 777,2	52 221,5	80,7
Austria	6 275,7	1 948,1	408,4	1 539,7	7 815,4	12,1
Belgium	1 204,1	1 042,9	505,6	537,3	1 741,5	2,7
Cyprus	1 113,3	449,5	412,0	37,4	1 150,7	1,8
United Kingdom	1 464,3	760,4	634,3	126,1	1 590,4	2,5
France	2 826,5	910,6	699,7	210,9	3 037,4	4,7
Netherlands	8 349,5	8 793,0	5 676,4	3 116,6	11 466,1	17,7
Luxemburg	1 998,3	4 040,3	1 831,9	2 208,4	4 206,7	6,5
Germany	17 483,0	3 968,4	2 201,7	1 766,7	19 249,7	29,7
Spain	789,7	203,8	285,3	- 81,5	708,2	1,1
Switzerland	1 044,0	873,3	272,1	601,3	1 645,2	2,5
America	5 232,6	2 507,6	- 1 151,9	1 355,7	6 588,3	10,2
North America	2 121,0	1 430,1	- 849,5	580,6	2 701,7	4,2
United States	1 794,6	1 310,9	- 822,7	488,2	2 282,8	3,5
Central America	3 102,5	1 071,4	- 199,6	871,8	3 974,2	6,1
South America	9,1	6,1	- 102,8	- 96,7	- 87,7	- 0,1
Asia	1 892,0	1 145,2	1 021,5	123,8	2 015,8	3,1
Other Asian Countries	1 864,8	966,3	370,4	595,9	2 460,7	3,8
of which: South Korea	751,9	133,2	26,6	106,6	858,5	1,3
Japan	816,9	143,3	135,2	8,1	825,0	1,3
Africa	44,2	28,4	- 24,3	4,2	48,4	0,1
Oceania & Polar Regions	- 3,5	22,0	- 5,3	16,7	13,2	0,0
International Organisations	5,5	-	-	-	5,5	0,0
Not allocated	3 818,0	-	-	-	3 818,0	5,9
Total	57 433,2	28 653,8	- 21 376,3	7 277,6	64 710,7	100,0

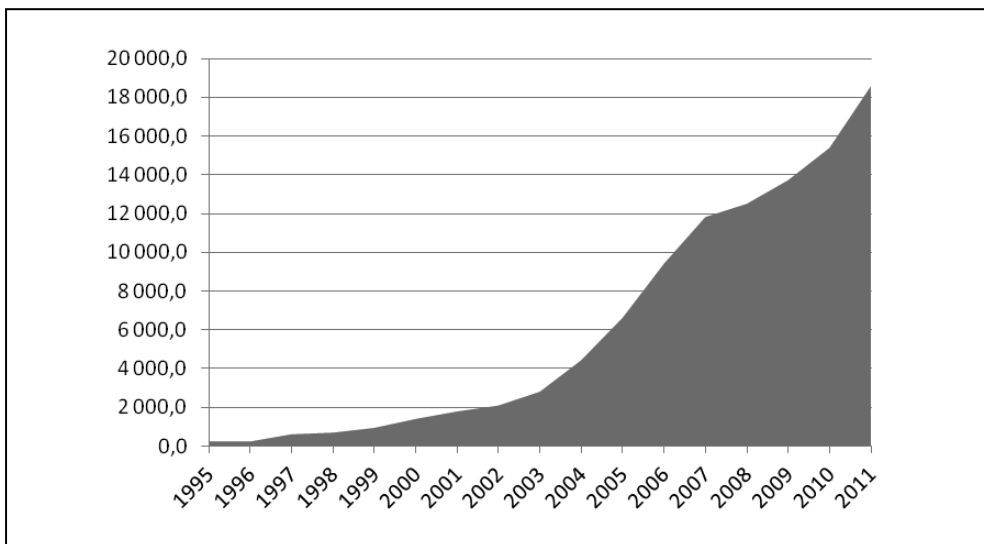
## FDI stocks abroad broken down by the investors' country, 2011

Euro million						
The investments' country	Equity capital and reinvested	Other capital			Direct investment	% share in OFDI
		Liabilities, net	Assets, net	Net assets		
Europe	9 356,6	652,6	2 901,5	2 248,9	11 605,5	62,52
Bulgaria	821,8	3,2	13,5	10,2	832,0	4,48
Cyprus	472,2	149,8	578,8	429,0	901,3	4,85
Czech Republic	228,6	62,5	83,4	20,9	249,5	1,34
Croatia	2 735,4	5,2	185,4	180,1	2 915,5	15,71
Poland	203,1	14,4	74,5	60,1	263,3	1,42
Luxemburg	305,9	0,2	12,6	12,3	318,2	1,71
Macedonia	447,2	113,2	0,0	- 113,2	334,0	1,80
Italy	33,2	3,7	495,4	491,7	524,9	2,83
Russia	311,7	1,2	134,2	133,0	444,7	2,40
Romania	330,6	66,0	196,4	130,4	461,0	2,48
Switzerland	478,3	45,4	658,9	613,5	1 091,8	5,88
Serbia	333,2	4,3	48,3	44,0	377,2	2,03
Slovakia	1 605,2	58,9	49,4	- 9,5	1 595,6	8,60
Ukraine	390,3	0,0	15,6	15,5	405,8	2,19
America	2 220,1	41,2	3 197,9	3 156,7	5 376,9	28,96
North America	79,6	14,6	378,2	363,6	443,2	2,39
United States	78,5	14,6	372,7	358,1	436,6	2,35
Central America	2 098,9	25,8	2 773,4	2 747,6	4 846,5	26,11
South America	41,7	0,8	46,3	45,5	87,2	0,47
Asia	1 081,5	30,7	115,7	85,0	1 166,5	6,28
Near and Middle East	315,2	0,1	81,8	81,7	396,9	2,14
Israel	308,0	-	25,5	25,5	333,5	1,80
Other Asian Countries	766,3	30,6	33,9	3,3	769,6	4,15
of wich: South Korea	366,3	24,0	0,5	- 23,5	342,8	1,85
Singapore	340,2	3,8	1,2	- 2,5	337,7	1,82
Africa	1,4	-	0,3	0,3	1,8	0,01
Oceania & Polar Regions	0,7	-	1,9	1,9	2,7	0,01
International Organisations	-	-	-	-	-	0,00
Not allocated	410,7	-	-	-	410,7	2,21
Total	13 071,1	724,5	6 217,4	5 493,0	18 564,1	100,00

Source: MNB

Figure 11a

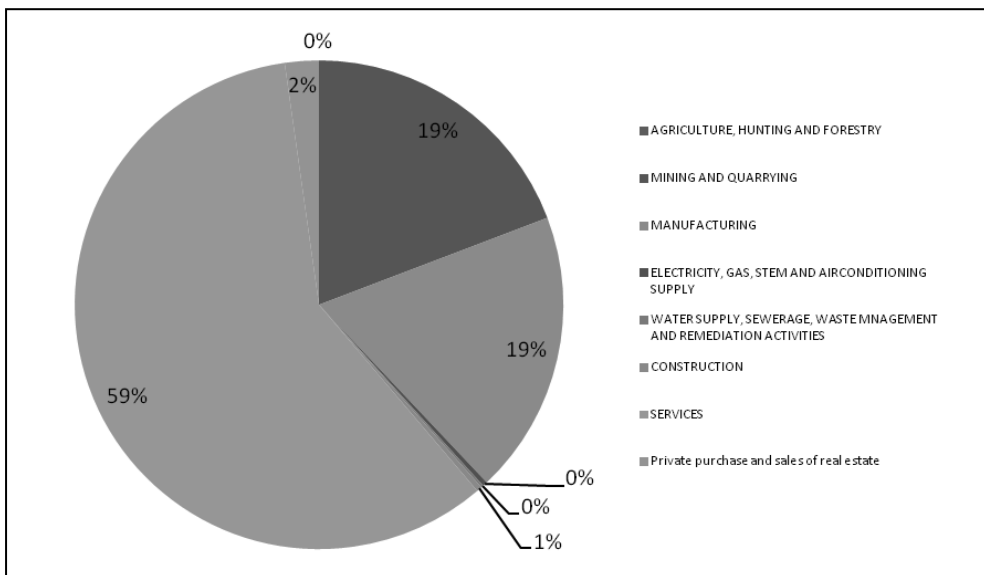
**Hungary's foreign direct investment stock abroad,  
1995-2011 (million Euros)**



Source: MNB

Figure 11b

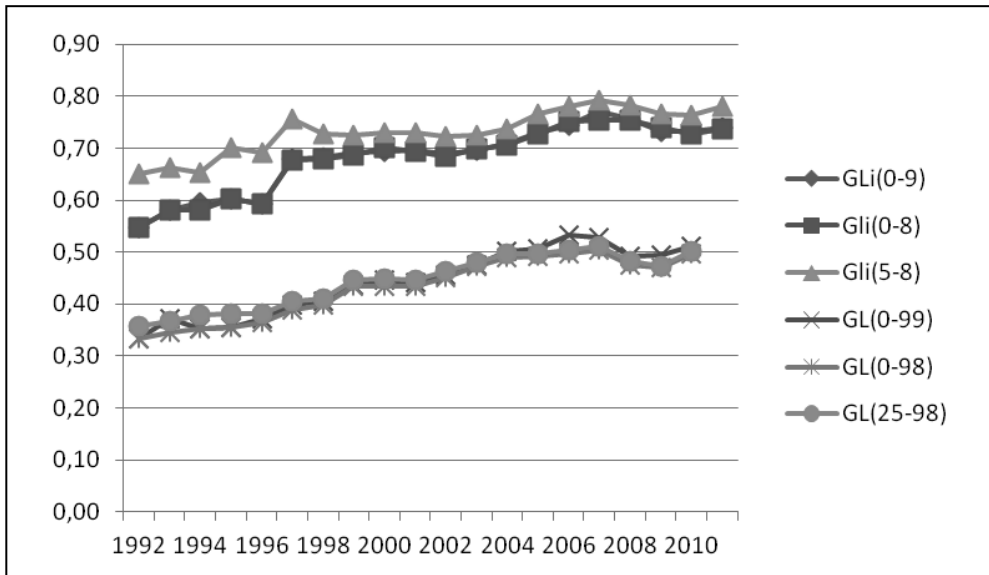
**Hungary's foreign direct investment stock abroad by  
economic activity, 2011**



Source: MNB

Figure 12

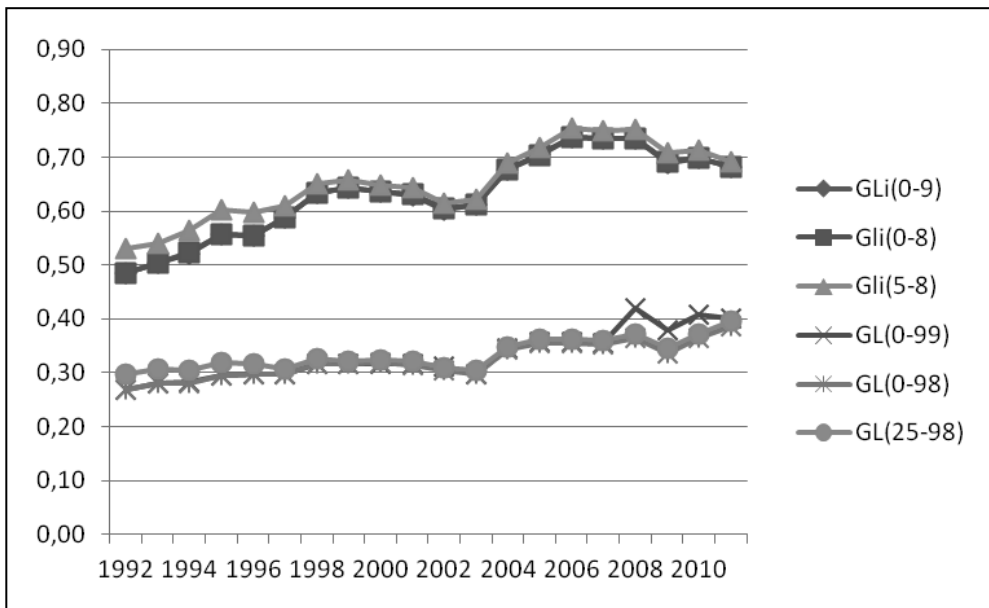
**Hungary—World IIT indices, SITC Rev. 1. AG3 and HS92 AG6 level**



Source: Author's own calculations

Figure 13

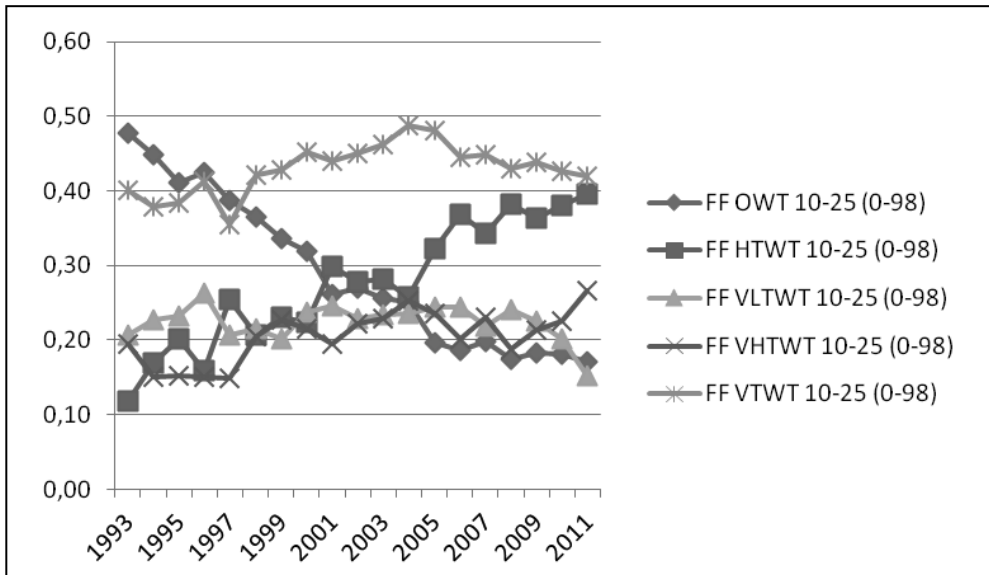
**Hungary—Germany IIT indices, SITC Rev. 1. AG3 and HS92 AG6 level**



Source: Authors own calculations

Figure 14

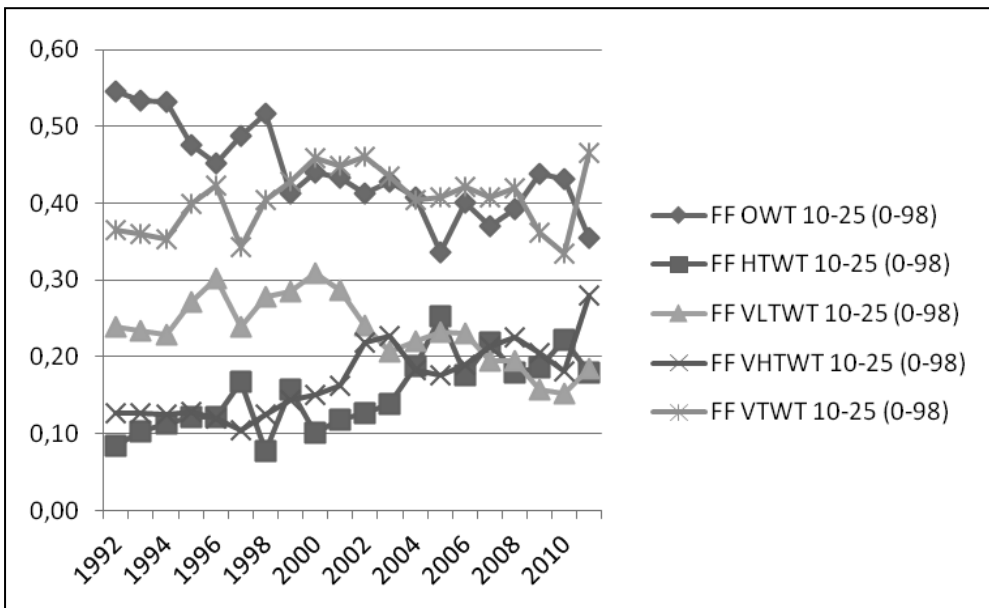
### Hungary-World FF indices, HS92 AG6 level



Source: Author's own calculations

Figure 15

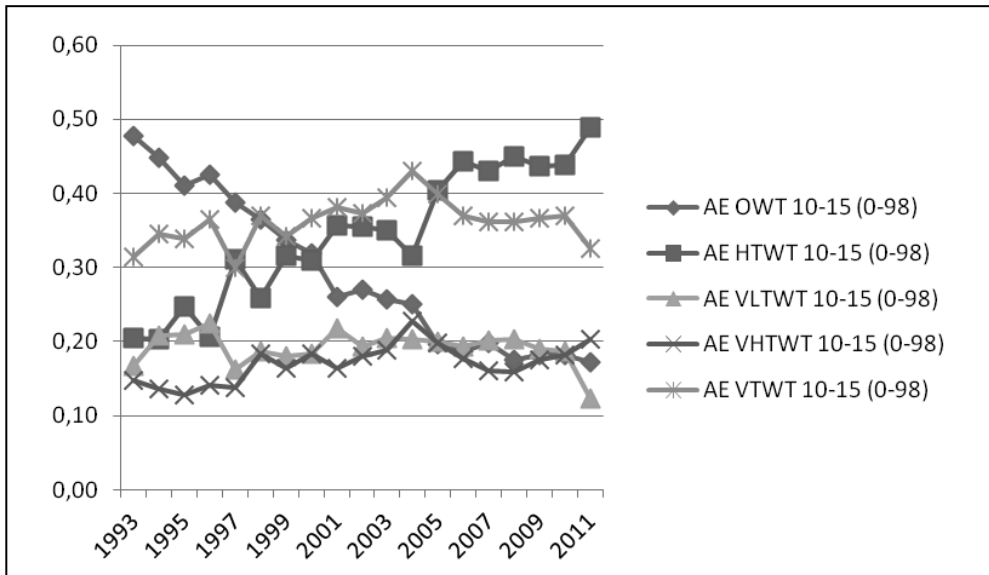
### Hungary-Germany FF indices, HS92 AG6 level



Source: Authors own calculations

Figure 16

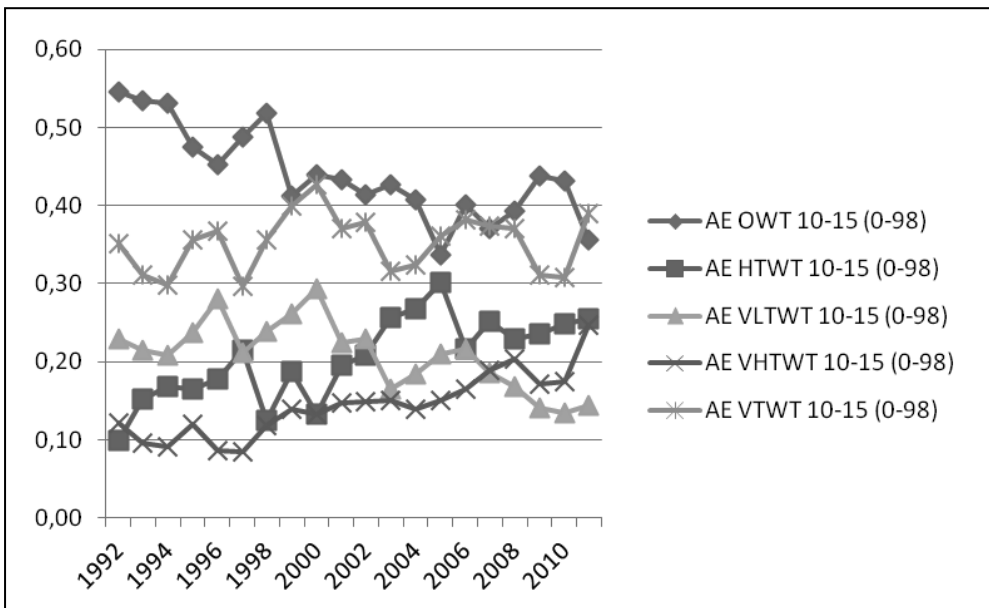
**Hungary—World, AE-indices, HS92 AG6 level**



Source: Authors own calculations

Figure 17

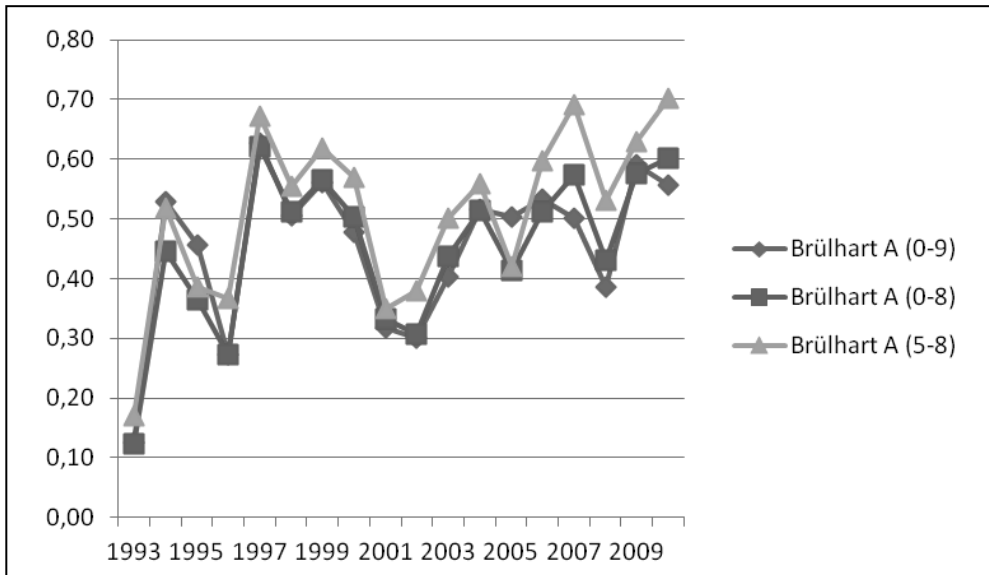
**Hungary—Germany, AE-indices, HS92 AG6 level**



Source: Authors own calculations

Figure 18

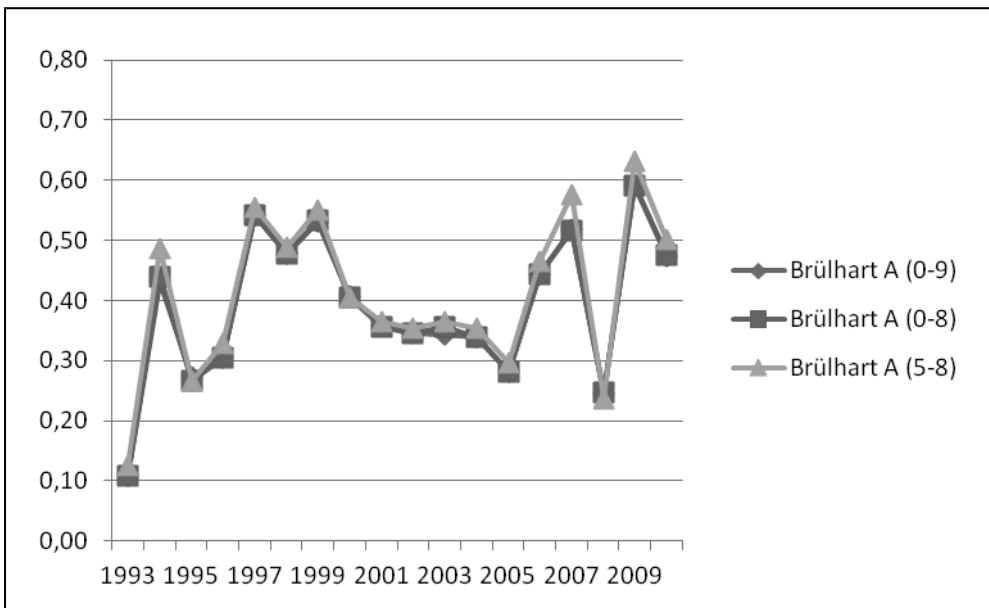
**Hungary—World Brülhart A MIIT indices, SITC Rev. 1, AG3 level**



Source: Authors own calculations

Figure 19

**Hungary—Germany Brülhart A MIIT indices, SITC Rev. 1, AG3 level**



Source: Authors own calculations



Table 3

## Hungary—World IIT indices 1

Classification No. of industries	Year	GI(0-9)		GI(0-8)		GI(5-8)		Shelburne (0-9)		Shelburne (0-8)		Shelburne (5-8)		Brillhart A (0-9)		Brillhart A (0-8)		Brillhart A (5-8)		GI(0-99)		GI(0-98)		GI(25-98)	
		SITC Rev. 1, AG3	SITC Rev. 1, AG3	SITC Rev. 1, AG3	SITC Rev. 1, AG3	SITC Rev. 1, AG3	SITC Rev. 1, AG3	SITC Rev. 1, AG3	SITC Rev. 1, AG3	SITC Rev. 1, AG3	SITC Rev. 1, AG3	SITC Rev. 1, AG3	SITC Rev. 1, AG3	SITC Rev. 1, AG3	SITC Rev. 1, AG3	SITC Rev. 1, AG3	SITC Rev. 1, AG3	SITC Rev. 1, AG3	SITC Rev. 1, AG3	HS92, AG6	HS92, AG6	HS92, AG6	HS92, AG6	HS92, AG6	HS92, AG6
Partner: World																									
No. of industries	1992	0.55	0.55	0.55	0.65	0.65	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
	1993	0.58	0.58	0.58	0.66	0.66	0.13	0.13	0.18	0.18	0.12	0.12	0.12	0.12	0.12	0.12	0.17	0.33	0.33	0.33	0.33	0.33	0.36	0.36	
	1994	0.60	0.58	0.58	0.65	0.65	0.55	0.47	0.54	0.54	0.53	0.45	0.52	0.37	0.37	0.34	0.37	0.35	0.35	0.35	0.35	0.38	0.38		
	1995	0.60	0.60	0.60	0.70	0.70	0.48	0.48	0.52	0.40	0.40	0.46	0.36	0.36	0.36	0.39	0.35	0.35	0.35	0.35	0.35	0.38	0.38		
	1996	0.59	0.59	0.59	0.69	0.69	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.36	0.36		
	1997	0.68	0.68	0.68	0.76	0.76	0.60	0.60	0.65	0.59	0.65	0.65	0.62	0.62	0.62	0.67	0.37	0.37	0.36	0.36	0.36	0.38	0.38		
	1998	0.68	0.68	0.68	0.73	0.73	0.49	0.50	0.55	0.50	0.55	0.51	0.56	0.57	0.51	0.56	0.56	0.40	0.40	0.39	0.40	0.40	0.41		
	1999	0.69	0.69	0.69	0.73	0.73	0.50	0.51	0.51	0.51	0.56	0.57	0.57	0.57	0.57	0.62	0.40	0.40	0.40	0.40	0.40	0.41	0.41		
	2000	0.69	0.70	0.70	0.73	0.73	0.38	0.38	0.41	0.41	0.48	0.48	0.48	0.48	0.48	0.57	0.44	0.44	0.44	0.44	0.43	0.45	0.45		
	2001	0.70	0.69	0.69	0.73	0.73	0.33	0.33	0.35	0.35	0.37	0.32	0.33	0.35	0.35	0.35	0.35	0.45	0.45	0.44	0.44	0.45	0.45		
	2002	0.69	0.69	0.69	0.72	0.72	0.40	0.40	0.42	0.42	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.44	0.44	0.44	0.44	0.45	0.45		
	2003	0.70	0.70	0.70	0.73	0.73	0.56	0.56	0.58	0.58	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.46	0.46	0.46	0.46	0.45	0.46		
	2004	0.71	0.71	0.71	0.74	0.74	0.62	0.62	0.62	0.62	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.47	0.47	0.47	0.47	0.48	0.48		
	2005	0.73	0.73	0.73	0.77	0.77	0.53	0.53	0.44	0.44	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.50	0.50	0.50	0.49	0.49	0.50		
	2006	0.75	0.75	0.75	0.78	0.78	0.57	0.57	0.56	0.56	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.51	0.51	0.51	0.49	0.49	0.50		
	2007	0.77	0.77	0.75	0.79	0.79	0.60	0.60	0.66	0.66	0.75	0.75	0.75	0.75	0.75	0.75	0.69	0.53	0.53	0.50	0.50	0.51	0.51		
	2008	0.76	0.75	0.75	0.78	0.78	0.48	0.48	0.52	0.52	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.43	0.43	0.43	0.50	0.50	0.51		
2009	0.73	0.74	0.74	0.77	0.77	0.72	0.72	0.69	0.69	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.59	0.59	0.59	0.48	0.48	0.48			
2010	0.73	0.73	0.73	0.76	0.76	0.55	0.55	0.60	0.60	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.56	0.60	0.60	0.47	0.47	0.47			
2011	0.74	0.74	0.74	0.78	0.78	0.68	0.68	0.67	0.67	0.74	0.74	na	na	na	na	na	na	0.51	0.51	0.50	0.50	0.50			

Source: Author's own calculations

Table 4

## Hungary—World IIT indices 2

[illegible]

Source: Author's own calculations

Table 5

## Hungary—Germany IIT indices 1

Classification	Year	GII(0-9)		GII(0-8)		GII(5-8)		Shelburne (0-9)		Shelburne (0-8)		Shelburne (5-8)		Brühlart A (0-9)		Brühlart A (0-8)		Brühlart A (5-8)		GII(0-99)		GII(25-98)	
		SITC Rev. 1, AG3	SITC Rev. 1, AG3	SITC Rev. 1, AG3	SITC Rev. 1, AG3	SITC Rev. 1, AG3	SITC Rev. 1, AG3	SITC Rev. 1, AG3	SITC Rev. 1, AG3	SITC Rev. 1, AG3	SITC Rev. 1, AG3	SITC Rev. 1, AG3	SITC Rev. 1, AG3	SITC Rev. 1, AG3	SITC Rev. 1, AG3	SITC Rev. 1, AG3	SITC Rev. 1, AG3	SITC Rev. 1, AG3	SITC Rev. 1, AG3	HS92, AG6	HS92, AG6	HS92, AG6	HS92, AG6
Partner: Germany	No. of industries	179	175	101	179	175	na	na	na	101	179	na	na	175	101	179	na	na	101	4836	4834	4194	
	1992	0.48	0.48	0.53	0.54	0.15	na	0.15	0.18	0.11	0.11	0.13	0.27	0.27	0.28	0.28	0.28	0.30	0.27	0.27	0.30		
	1993	0.50	0.50	0.54	0.54	0.45	0.45	0.46	0.51	0.43	0.43	0.44	0.49	0.44	0.44	0.49	0.49	0.30	0.28	0.28	0.31		
	1994	0.52	0.52	0.56	0.56	0.45	0.45	0.46	0.51	0.43	0.43	0.44	0.49	0.44	0.44	0.49	0.49	0.30	0.28	0.28	0.30		
	1995	0.56	0.56	0.60	0.60	0.37	0.37	0.37	0.42	0.27	0.27	0.27	0.30	0.27	0.27	0.30	0.30	0.30	0.32	0.30	0.32		
	1996	0.55	0.55	0.60	0.60	0.30	0.30	0.30	0.33	0.31	0.31	0.33	0.33	0.31	0.31	0.33	0.30	0.30	0.30	0.30	0.32		
	1997	0.59	0.59	0.61	0.61	0.53	0.53	0.53	0.54	0.54	0.54	0.54	0.55	0.54	0.54	0.55	0.55	0.30	0.30	0.30	0.31		
	1998	0.63	0.63	0.65	0.65	0.46	0.46	0.46	0.47	0.48	0.48	0.48	0.49	0.48	0.48	0.49	0.49	0.32	0.32	0.32	0.33		
	1999	0.64	0.64	0.66	0.66	0.48	0.48	0.48	0.50	0.53	0.53	0.53	0.55	0.53	0.53	0.55	0.55	0.32	0.32	0.32	0.32		
	2000	0.64	0.64	0.65	0.65	0.35	0.35	0.35	0.35	0.41	0.41	0.41	0.40	0.41	0.40	0.40	0.40	0.32	0.32	0.32	0.32		
	2001	0.63	0.63	0.64	0.64	0.36	0.36	0.36	0.37	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.30	0.32	0.32	0.31		
	2002	0.60	0.61	0.62	0.62	0.43	0.43	0.43	0.44	0.44	0.44	0.44	0.45	0.44	0.44	0.45	0.45	0.31	0.30	0.30	0.31		
	2003	0.61	0.61	0.62	0.62	0.45	0.45	0.46	0.47	0.47	0.47	0.47	0.46	0.47	0.46	0.46	0.46	0.30	0.30	0.30	0.30		
	2004	0.68	0.68	0.69	0.69	0.47	0.47	0.47	0.47	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.34	0.34	0.34	0.35		
	2005	0.71	0.70	0.72	0.72	0.29	0.29	0.29	0.29	0.30	0.28	0.28	0.30	0.28	0.28	0.30	0.30	0.36	0.36	0.36	0.36		
	2006	0.74	0.74	0.74	0.74	0.49	0.49	0.49	0.49	0.52	0.44	0.44	0.47	0.46	0.44	0.47	0.46	0.36	0.36	0.36	0.36		
2007	0.73	0.73	0.75	0.75	0.60	0.60	0.60	0.65	0.52	0.52	0.52	0.58	0.52	0.52	0.58	0.58	0.36	0.35	0.35	0.36			
2008	0.74	0.74	0.75	0.75	0.35	0.35	0.35	0.35	0.35	0.25	0.25	0.25	0.24	0.25	0.24	0.24	0.36	0.37	0.37	0.37			
2009	0.69	0.69	0.71	0.71	0.66	0.66	0.66	0.66	0.69	0.59	0.59	0.59	0.63	0.59	0.63	0.63	0.38	0.34	0.34	0.35			
2010	0.70	0.70	0.71	0.71	0.46	0.46	0.46	0.46	0.47	0.47	0.47	0.50	0.47	0.47	0.50	0.47	0.41	0.36	0.37	0.37			
2011	0.68	0.68	0.69	0.69	0.59	0.59	0.59	0.62	na	na	na	na	na	na	na	na	na	0.40	0.39	0.40	0.40		
Partner: Germany	Classification	Exports (0-99)	Imports (0-99)	Exports (0-98)	Imports (0-98)	Exports (25-98)	Imports (25-98)																
	No. of industries	4836	4836	4834	4834	4194	4194																
	1992	2 880 841 000	2 592 303 000	2 880 841 000	2 592 303 000	2 350 465 000	2 495 288 000																
	1993	2 292 346 000	2 674 915 000	2 292 346 000	2 674 915 000	1 865 333 000	2 556 233 000																
	1994	3 017 454 000	3 402 866 000	2 918 910 000	3 380 983 000	2 405 680 000	3 226 369 000																
	1995	3 633 420 000	3 602 395 000	3 633 420 000	3 602 395 000	3 087 012 000	3 502 622 000																
	1996	3 754 592 000	3 796 622 000	3 754 592 000	3 796 622 000	3 231 588 000	3 702 479 000																
	1997	7 033 151 048	5 694 906 008	7 033 151 048	5 694 906 008	6 556 846 048	5 597 580 008																
	1998	8 356 772 952	7 233 584 976	8 356 772 952	7 233 584 976	7 864 553 952	7 133 084 976																
	1999	9 599 872 000	8 188 800 000	9 545 093 000	8 170 822 000	9 099 014 000	8 081 050 000																
	2000	10 471 263 000	8 213 042 000	10 386 710 000	8 200 977 000	9 961 579 000	8 084 327 000																
	2001	10 858 885 000	8 392 524 000	10 671 524 000	8 329 149 000	10 233 319 000	8 206 445 000																
	2002	12 162 077 000	9 144 482 000	11 970 512 000	9 010 372 000	11 444 664 000	8 853 028 000																
	2003	14 429 102 000	11 626 229 000	14 429 102 000	11 564 278 000	13 858 692 000	11 331 192 000																
	2004	17 510 866 000	17 601 211 000	17 441 407 000	17 528 904 000	16 761 328 000	17 057 720 000																
	2005	18 059 449 000	17 215 991 000	17 995 067 000	17 138 955 000	17 388 624 000	16 496 594 000																
2006	20 698 463 000	19 593 063 000	20 649 997 000	19 516 740 000	20 001 042 000	18 795 022 000																	
2007	25 054 840 000	23 172 523 000	24 988 090 000	23 071 810 000	24 110 931 000	22 142 898 000																	
2008	28 909 331 000	27 776 612 000	26 423 072 000	25 182 915 000	25 275 106 000	24 078 573 000																	
2009	21 101 987 000	19 198 627 000	16 599 911 000	16 784 080 000	18 554 586 000	15 835 737 000																	
2010	23 854 533 000	22 271 884 000	22 065 993 000	19 642 523 000	21 115 159 000	18 696 350 000																	
2011	27 550 353 000	24 178 676 000	26 588 108 000	22 205 979 000	25 319 474 000	21 088 342 000																	

Source: Author's own calculations

Table 6

## Hungary—Germany IIT indices

Classification	Year	Partner: Germany															
		FF OWIT 10-25 (0-98)	FF NS 10-25 (0-98)	FF HTWT 10-25 (0-98)	FF VMTWT 10-25 (0-98)	FF WHWT 10-25 (0-98)	FF VTWT 10-25 (0-98)	FF OWIT 10-25 (25-98)	FF NS 10-25 (25-98)	FF HTWT 10-25 (25-98)	FF VMTWT 10-25 (25-98)	FF WHWT 10-25 (25-98)	FF VTWT 10-25 (25-98)	FF OWIT 10-25 (25-98)	FF NS 10-25 (25-98)	FF HTWT 10-25 (25-98)	FF VTWT 10-25 (25-98)
No. of industries		H592.A66	H592.A66	H592.A66	H592.A66	H592.A66	H592.A66	H592.A66	H592.A66	H592.A66	H592.A66	H592.A66	H592.A66	H592.A66	H592.A66	H592.A66	H592.A66
1992	0.55	0.00	0.08	0.24	0.13	0.13	0.37	0.50	0.01	0.09	0.26	0.14	0.14	0.39	0.40		
1993	0.53	0.00	0.11	0.27	0.12	0.13	0.35	0.49	0.00	0.12	0.25	0.13	0.38				
1994	0.48	0.00	0.12	0.27	0.13	0.13	0.40	0.44	0.00	0.13	0.29	0.14	0.43				
1995	0.48	0.00	0.12	0.30	0.12	0.12	0.42	0.41	0.00	0.13	0.32	0.13	0.45				
1996	0.45	0.00	0.17	0.24	0.10	0.10	0.34	0.47	0.00	0.12	0.25	0.13	0.46				
1997	0.49	0.00	0.16	0.28	0.14	0.14	0.43	0.40	0.00	0.16	0.29	0.15	0.44				
1998	0.41	0.00	0.16	0.28	0.14	0.14	0.43	0.40	0.00	0.16	0.29	0.15	0.44				
1999	0.41	0.00	0.10	0.31	0.15	0.15	0.46	0.43	0.00	0.10	0.32	0.15	0.47				
2000	0.44	0.00	0.12	0.29	0.16	0.16	0.45	0.42	0.00	0.12	0.29	0.16	0.46				
2001	0.41	0.00	0.13	0.24	0.22	0.22	0.46	0.40	0.00	0.13	0.25	0.22	0.44				
2002	0.43	0.00	0.14	0.21	0.18	0.18	0.40	0.40	0.00	0.14	0.21	0.23	0.44				
2003	0.41	0.00	0.19	0.22	0.18	0.18	0.40	0.40	0.00	0.19	0.22	0.19	0.41				
2004	0.41	0.00	0.18	0.23	0.18	0.18	0.40	0.40	0.00	0.18	0.23	0.19	0.41				
2005	0.40	0.00	0.18	0.23	0.19	0.19	0.41	0.39	0.00	0.18	0.24	0.18	0.41				
2006	0.37	0.00	0.22	0.19	0.21	0.21	0.41	0.36	0.00	0.22	0.20	0.21	0.41				
2007	0.39	0.01	0.18	0.19	0.23	0.23	0.42	0.38	0.01	0.18	0.20	0.23	0.43				
2008	0.44	0.01	0.22	0.16	0.20	0.20	0.36	0.42	0.02	0.19	0.16	0.21	0.37				
2009	0.43	0.01	0.18	0.15	0.28	0.28	0.47	0.42	0.00	0.23	0.19	0.18	0.48				
2010	0.43	0.00	0.18	0.19	0.33	0.33	0.47	0.34	0.00	0.18	0.19	0.29	0.48				
2011	0.38																

Classification	Year	Partner: Germany															
		FF OWIT 10-15 (0-98)	FF NS 10-15 (0-98)	FF HTWT 10-15 (0-98)	FF VMTWT 10-15 (0-98)	FF WHWT 10-15 (0-98)	FF VTWT 10-15 (0-98)	FF OWIT 10-15 (25-98)	FF NS 10-15 (25-98)	FF HTWT 10-15 (25-98)	FF VMTWT 10-15 (25-98)	FF WHWT 10-15 (25-98)	FF VTWT 10-15 (25-98)	FF OWIT 10-15 (25-98)	FF NS 10-15 (25-98)	FF HTWT 10-15 (25-98)	FF VTWT 10-15 (25-98)
No. of industries		H592.A66	H592.A66	H592.A66	H592.A66	H592.A66	H592.A66	H592.A66	H592.A66	H592.A66	H592.A66	H592.A66	H592.A66	H592.A66	H592.A66	H592.A66	H592.A66
1992	0.55	0.00	0.10	0.21	0.12	0.12	0.35	0.50	0.01	0.11	0.25	0.13	0.39				
1993	0.53	0.00	0.15	0.21	0.10	0.10	0.31	0.49	0.00	0.16	0.23	0.13	0.40				
1994	0.48	0.00	0.17	0.24	0.12	0.12	0.36	0.44	0.00	0.18	0.26	0.13	0.42				
1995	0.48	0.00	0.16	0.24	0.12	0.12	0.36	0.44	0.00	0.18	0.26	0.13	0.42				
1996	0.45	0.00	0.21	0.24	0.10	0.10	0.34	0.47	0.00	0.22	0.22	0.13	0.43				
1997	0.49	0.00	0.21	0.24	0.12	0.12	0.36	0.50	0.00	0.22	0.22	0.13	0.43				
1998	0.52	0.00	0.12	0.24	0.12	0.12	0.36	0.50	0.00	0.13	0.25	0.12	0.41				
1999	0.41	0.00	0.19	0.26	0.14	0.14	0.40	0.40	0.00	0.19	0.27	0.14	0.41				
2000	0.44	0.00	0.13	0.29	0.13	0.13	0.43	0.43	0.00	0.13	0.30	0.15	0.44				
2001	0.43	0.00	0.20	0.22	0.15	0.15	0.37	0.42	0.00	0.20	0.23	0.15	0.38				
2002	0.41	0.00	0.21	0.23	0.15	0.15	0.38	0.40	0.00	0.21	0.24	0.15	0.39				
2003	0.41	0.00	0.22	0.23	0.12	0.12	0.32	0.40	0.00	0.22	0.24	0.12	0.39				
2004	0.41	0.00	0.27	0.18	0.12	0.12	0.32	0.40	0.00	0.27	0.19	0.13	0.33				
2005	0.41	0.00	0.30	0.21	0.15	0.15	0.36	0.42	0.00	0.31	0.21	0.15	0.37				
2006	0.40	0.00	0.22	0.22	0.16	0.16	0.38	0.39	0.00	0.22	0.22	0.16	0.38				
2007	0.37	0.00	0.25	0.19	0.19	0.19	0.37	0.36	0.00	0.26	0.19	0.19	0.38				
2008	0.39	0.01	0.17	0.17	0.20	0.20	0.31	0.42	0.02	0.24	0.14	0.21	0.42				
2009	0.44	0.01	0.24	0.14	0.17	0.17	0.31	0.42	0.01	0.25	0.15	0.17	0.32				
2010	0.43	0.01	0.25	0.13	0.28	0.28	0.31	0.42	0.00	0.25	0.14	0.18	0.42				
2011	0.38	0.00	0.25	0.34	0.33	0.33	0.39	0.34	0.00	0.25	0.15	0.29	0.40				

Source: Author's own calculations

## Mathematical appendix

$$GL = \sum_{i=1}^n w_i GL_i, \text{ where} \quad /1/$$

$$GL_i = \frac{(X_i + M_i) - |X_i - M_i|}{X_i + M_i} = 1 - \frac{|X_i - M_i|}{X_i + M_i}, \text{ where} \quad /2/$$

$X_i$  and  $M_i$  are exports and imports of industry  $i$ , and  $w_i$  is industry  $i$ 's trade share in total trade:

$$w_i = \frac{X_i + M_i}{\sum_{i=1}^n (X_i + M_i)}. \quad /3/$$

$$\frac{\min(X_i; M_i)}{\max(X_i; M_i)} > \gamma, \text{ where } 0 \leq \gamma \leq 1 \quad /4/$$

$$\frac{1}{1 + \alpha} \leq \frac{UV_i^X}{UV_i^M} \leq 1 + \alpha, \quad /5/$$

where UVs are unit values of exports and imports in the  $i$ -th sector, respectively

$$FF_i^Z = \frac{\sum_{k=1}^m (X_{ik}^Z + M_{ik}^Z)}{\sum_{k=1}^m (X_{ik} + M_{ik})}, \quad /6/$$

where  $Z$  is the trade type (one-way, horizontal or vertical /low or high/).

$$PQH = 1 - \frac{UV_i^X - UV_i^M}{UV_i^X + UV_i^M} \quad /7/$$

$$MIIT_{BA,t} = \sum_{i=1}^n z_{i,t} \cdot MIIT_{BA,i,t} \quad /8/$$

$$MIIT_{BA,i,t} = 1 - \frac{|\Delta X_i - \Delta M_i|}{|\Delta X_i| + |\Delta M_i|} \quad /9/$$

$$z_{i,t} = \frac{|\Delta X_i| + |\Delta M_i|}{\sum_{i=1}^n (|\Delta X_i| + |\Delta M_i|)} \quad /10/$$

$$MIIT_{AE,i,t} = \frac{\Delta X_i - \Delta M_i}{2 \cdot \max[|\Delta X_i|; |\Delta M_i|]} \quad /11/$$

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Szabolcs Pásztor

## Measuring the Border Effect in Hungary – the Case of the Eastern Borders

### 1. Introduction

The Central and Eastern European (CEE) region, including Hungary, has seen massive economic, social and structural changes since the beginnings of the 1990's. The intense shock waves made by the general transformation affected almost every part of the economic and social framework, not only within but also between countries. With the disintegration of former states, new ones emerged as well, several multinational companies appeared and, thanks to the enormous capital inflows and in parallel with the decline in previous trade links, new relations were taking shape. It was a unique coincidence that these tendencies were gaining ground exactly when the overall globalisation of the world economy, European integration and the disappearance of the previously isolating borders were the order of the day (*Ohmae, 1995*). Thanks to these parallel, and to a certain extent related, tendencies, the countries of CEE at the turn of the third millennium show a strong economic and trade integration with each other and the world economy. As a consequence, they are regarded as completely open economies.

Hungary's general geographic and economic state is particularly interesting in this new relational network. On the one hand, it became a kind of border country (*Hajdú, 2000*) after the transformation of the 1990's and on the other hand, the largest part of the gross domestic product (GDP) is directly related to multinational companies established in the country. In addition, the European Union (EU) accession of 2004 and the enlargement of the Schengen Zone in 2007 strongly contributed to the following hypothesis: Hungary is the kind of open, small economy where the economic interactions and the individuals' lives are less and less influenced by isolating state borders.

However, it is worthwhile pointing to those studies which highlight the bottlenecks of economic interactions, even in the case of totally interdependent and open countries (*Collier – Vickerman, 2001; Brülhart, 2011; inter alia*). A large number of academic papers prove, for example, the existence of a border effect which represents the difference between intra-national and inter-national trade and price distortions (*Morshed, 2007*). The findings are clear and point in one direction. The American context, for example,

(Wolf, 2000; Head-Mayer, 2002; Coughlin-Novy, 2011), the US-Canadian relationship (McCallum, 1995; Helliwell, 1998; Anderson-Smith, 1999, *inter alia*), EU countries (Nitsch, 2000; Head-Mayer, 2000; Chen, 2004; Balta-Delgado, 2009; Pacchioli, 2011) and other relationships (Morshed, 2007; Fukao – Okubo, 2011) all confirm the fact that the role of state borders in affecting economic interactions disappears very slowly or remains strong, even in the long run. This feature is the result of certain explanatory factors: different languages, cultures, mentalities, the lack of a common currency, asymmetric economic relations, home bias in consumption, etc.

Bearing this in mind, it would be extremely interesting to first test our initial hypothesis and later shed some light on the existence and strength of the border effect along the Hungarian borders. Finally, an analysis of the significant transforming effect of the eastern borders of Hungary (Hungary–Ukraine and Hungary–Romania) could give us a special insight into the effect of the enlargement of the EU and the Schengen Zone in the transformation process. These borders represent a gateway to European integration and, as a consequence, Hungary enjoys a kind of protective status.<sup>1</sup> A complete analysis of this kind could not omit an evaluation of the way European integration can play a significant role in integrating the neighbouring countries and border zones.

This paper has two aims. First of all, it tries to answer the questions mentioned above; then it intends to broaden the, so far quite poor, empirical findings regarding the Hungarian border effect. After a brief introduction, the theoretical approach of the research is presented and I specify the exact research area and the available data. Finally, I draw some conclusions.

## **2. Methodological framework<sup>2</sup>**

I try to present the transformation process of the CEE and Hungary with the help of a unique, complex method with the deliberate intention of contradicting those one-sided approaches which are extremely popular and abundant in the social sciences (Szentes, 2009, 2013; Csaba, 2013).

In my research I use different databases, data and non-related statistical methods in a well-defined research algorithm (*Fig. 1*). With this approach I try to describe the main focus of this paper in the most consistent way.

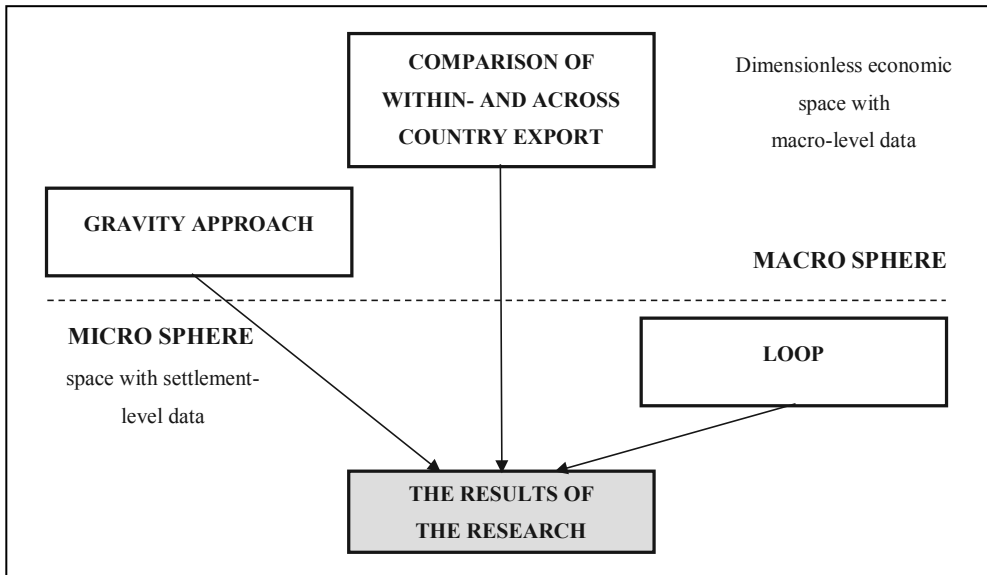
<sup>1</sup> The Hungarian borders are 2,242.4 km long. The Hungarian–Ukrainian (136.7 km), the Hungarian–Romanian (447.8 km), the Hungarian–Serbian (174.4 km) and the Hungarian–Croatian (344.6 km) borders are part of the external Schengen Zone border.

<sup>2</sup> This section does not intend to give a comprehensive overview of the methods used in border research like Tagai *et al* (2008); instead it intends to describe the methodology of my own research.



Fig. 1:

### The algorithm of the research



This research algorithm points to several essential facts. First of all it begins with a method using little data and dimensionless economic space, then uses a large selection of settlement-level data. From another perspective it analyses the existence of the border effect at macro and micro levels as well. When creating the methodological approach I placed great emphasis on this dual interpretation since according to Fernand Braudel, there is a so called double history phenomenon in our everyday life. This idea creates differentiation between the changes at the levels of small-scale and of public life, where macro and micro economic trends are the order of the day. The micro level is characterised by slow and small-scale changes (the history of individuals and everyday life) while the macro level (political, economic and social events and the history of intellectual movements) is just the opposite.<sup>3</sup>

An approach like mine is capable of describing both of them, so I can acquire an insight into the process of macro tendencies which appear in individuals' lives and the transformation of the narrowly-defined economic space and, last but not least, into the transformation process. The outlined algorithm in the context of what is mentioned above consists of three approaches (Fig. 1). With the help of the gravity approach and the comparison of internal and external exports the macro level can be modelled, while the so called Law of One Price (LOOP) is suited to describing the transformation of the micro level.

<sup>3</sup> See: Braudel (1985, 1996, 2003-2004, 2008).

## 2.1. The Gravity Approach

*Tinbergen (1962)* created the gravity approach which made the analysis of bilateral trade tendencies possible. Similarly to other concepts, the gravity approach also comes from physics and, based on Newtonian laws, it supposes a direct positive relation between the size of an economy and its absorbing potential. This means that a relatively big economy generates considerable trade in its neighbourhood which drops significantly with the increasing distance from the partners. So the gravity model argues that trade between two countries depends on economic development (positive) and relative distance (negative).

The approach was used exclusively to estimate the total trade between two countries for many years, so the general format of the gravity model was the following:

$$T_{ij} = A \cdot Y_i \cdot Y_j \cdot D_{ij}^{\theta} \quad (1)$$

In this equation  $T_{ij}$  represents the total trade between countries,  $Y_i$  and  $Y_j$  the GDP of certain countries and  $D_{ij}$  the distance between the countries in question.  $A$  is a constant, namely the gravity constant, while  $\theta$  is a negative index which indicates the decreasing trade volume by the increasing distance.

Later it became obvious that those borders which isolate borderlands play an important role in restricting the natural increase of total trade. It was no wonder that researchers who had dealt with this issue tried to extend and refine the general gravity model in order to better understand the existence of borders and the border effect. They incorporated such dummy variables as border, currency, language, adjacency, and internal and external trade and as a consequence, it became a general tendency that the application of a large number of statistically significant variables could lead to increasingly accurate results (*McCallum, 1995; Meinhof et al., 2003; Olper–Raimondi, 2008*). For the sake of example, I show an extended gravity approach in loglinear format:

$$\ln X_{ij} = \beta_0 + \beta_1 \text{home} + \beta_2 \ln Y_i + \beta_3 \ln Y_j + \beta_4 \text{adj}_{ij} + \beta_5 \text{cur}_{ij} + \beta_6 \text{lan}_{ij} + \beta_7 \ln D_{ij} + \varepsilon_{ij} \quad (2)$$

In this model *home* is a dummy variable which indicates the internal or external trade.  $\text{adj}_{ij}$  illustrates adjacency.  $\text{cur}_{ij}$  refers to the currency,  $\text{lan}_{ij}$  to the language, and  $\varepsilon_{ij}$  is the white noise error. The parameter  $\beta_1$  is the measure of the border effect and this incorporates everything which could trigger greater intra national trade than international trade. Put differently,  $\beta_1$  is a degree which shows the difference between internal and external trade, placing the gravity model on a more accurate footing. A number of studies were made using this approach and these expressly conducted research into the phenomenon of the border effect and ideas about the future of borderlands (*Wei, 1996; Nitsch, 2000; Wolf, 2000; Head–Mayer, 2000, 2002; Chen, 2004; inter alia*). In addition, *Anderson and van Wincoop (2001; 2004)* evolved a special gravity model which became well-known and widespread (*Feenstra, 2002; Daumal–Zignago, 2005*). As a consequence, we can draw the conclusion that the different gravity models

strongly dominate border research and the mapping of the exact effects of the transformation process.

In my own model not every previously mentioned variable is involved because Hungary and its neighbouring countries have special locations, histories, and societies and the individual countries show special features.<sup>4</sup> Taking these into consideration, I intend to use the following model:

$$\ln X_{i,j} = \beta_0 + \beta_1 \text{home} + \beta_2 \ln Y_i + \beta_3 \ln Y_j + \beta_4 \ln D_{i,j} + \beta_5 \text{adj} + \varepsilon_{i,j} \quad (3)$$

In this loglinear equation we focus on the sign, magnitude and change in the variable *home* over time which can perfectly illustrate the main features of the transformation process.

## 2.2. Methods of approximation

After analysing the national level, where general tendencies are taken into consideration, it is worth narrowing the spatial focus of our research and describing the border effect for one country (in our case Hungary). However, conducting such an analysis with the gravity approach is impossible because the statistical offices of Hungary and the neighbouring countries do not record intra national, regional level trade flows. In order to approximate the missing data and describe the phenomenon I have to turn to approximation methods.

Among these techniques the most popular is the approach in which regional trade flows are estimated by calculating the difference between the annual GDP and the total export of a country (Wei, 1996; Nitsch, 2000; Head and Mayer, 2000; Chen, 2004; *inter alia*). In addition, when I divide the difference by the total export value of a bilateral destination we can measure the ratio of within- and across country export (4). This indicator clearly shows us the level of export within a country and across its borders.

$$\text{Border effect} = \frac{\text{GDP} - \text{Total export}}{\text{Total bilateral export}} \quad (4)$$

When this indicator is relatively high the borders significantly restrict the international trade flows, and when it is low the transformation process is well under way and there are intense economic interactions across them.

Based on the approximating feature, I can observe the following two aspects. The ratio is suitable for an understanding of the specific tendencies and magnitudes; however, it is only capable of measuring the exact border effect to a certain extent. This is because the approximation of within country export using the difference between GDP and total export is too simplistic, and in order to get a more nuanced picture of the border effect measure we certainly need a larger database. This lack of exactness could lead us to test the LOOP, which is based on a large database and capable of representing spatial data.

<sup>4</sup> It would be meaningless to use the dummy variable of common language since in the Central and Eastern European countries different languages are spoken.

### 2.3 The Law of One Price (LOOP)

There is an alternative method used to measure the border effect and the transformation process: the LOOP (Ceglowski, 2003). The initial presumption of this approach is the following: in an efficient market the price of a product or a service expressed in local currency equals the multiplication of the price of the same item(s) in a foreign currency and the exchange rate between the two currencies. This concept, namely testing purchasing power parity (PPP), was first used at the time of the Napoleonic wars; however, it was Cassel (1918) who coined the name. This method makes a differentiation between absolute and relative PPP. According to the absolute form, the price ratio of consumer goods in two randomly chosen countries approximates the equilibrium exchange rate. The relative PPP theory argues that the fluctuation of relative prices equals the fluctuation of the exchange rate when we choose a period when the exchange rate was in balance as a base period.

When testing the LOOP, researchers usually compare within country prices and later between country prices. In the case of higher standard deviation, the explanatory factors can be detected by a multi-variable regression analysis (Goldberg-Verboven, 2001; Parsley-Wei, 2001; Haskel-Wolf, 2001; Morshed, 2007; Horváth et al., 2008; *inter alia*).

It was Engel and Rogers (1996) who drew our attention to the possible application of the LOOP in border research. Their paper provided the idea and methodological approach and gave others, like Horváth et al (2008) and the current author, a good starting point. Like Engel and Rogers (1996) in my model we suppose that the product level relative price is the real exchange rate:

$$Q_{x,y,t}^a = \frac{P_{x,t}^a}{P_{y,t}^a} \quad (5)$$

Here  $P_{x,t}^a$  is the nominal price of product  $a$ , in location  $x$ , at time  $t$ .  $P_{y,t}^a$  is also the nominal price of product  $a$ , in location  $y$ , at time  $t$ .  $a$  indicates the different products and  $x, y$  the different data points. In order to understand the time-series variability of the relative prices we have to measure its within country and between country standard deviation:

$$\sigma(q_{x,y}^a) \quad (6), \text{ where } q_{x,y}^a = \ln(Q_{x,y}^a) \quad (7)$$

When the between country standard deviation is systematically higher than the within country one, it is extremely important to shed some light on the explanatory factors. In order to reach this goal I use the following multi-variable regression equation:

$$\sigma_{x,y,t}^a = \beta_0 + \beta_1 HAT_{x,y} + \beta_2 \ln d_{x,y} + \varepsilon_{x,y}^a \quad (8)$$

In this model I try to explain the standard deviation between the different data points by two factors. First of all, we take the data pair(s) into consideration. If it falls into one country then the dummy  $HAT$  is zero, otherwise one. The other factor is the distance

between locations, since the greater transportation requirements obviously increase retail prices (*Disdier – Head, 2008*).

In the next step I try to understand the role of nominal exchange rates in the existence of the border effect. If we filter the price variability out of the nominal exchange rate, the border effect could be much better understood. This is definitely needed because the real exchange rate is the sum of the price ratio of cross-border data points and the fluctuation of the nominal exchange rate. Putting it differently, the real exchange rate is an exchange rate which takes into consideration the different inflation rates of the two partner countries. In the case of rigid local prices in the short run, the fluctuation of the exchange rate reflects the fluctuation of the nominal exchange rate. In order to incorporate the role of nominal exchange rates in within- and between country relative prices we have to correct our previous relative price approach (5). To carry out this I calculate the ratio of the local price  $P_{x,t}^a$  and the national price level  $P_t$ . Later I calculate those relative real prices which represent the cross-border data points  $P_{x,t}^a$  and  $P_{y,t}^a$  and the general price indices representing the two countries  $P_t$  and  $P_t^*$  (9):

$$\frac{\frac{P_{x,t}^a}{P_t}}{\frac{P_{y,t}^a}{P_t^*}} \quad (9)$$

Finally, with the help of a restructuring of the sample, I can evaluate other explanatory factors as well. For example, it is worthwhile restricting our database to those border regions whose economies and societies are severely influenced by national borders (*Hansen, 1977*). In this way we can test Braudel's notion of double history and also confront the macro and micro level border effects. The database offers another alternative, since it allows us to incorporate the special features of the economic history of Hungary, Ukraine and Romania. This is extremely important because the Trianon border and the common language in certain regions must be taken into account. We can evaluate these factors if we restrict the Ukrainian and Romanian data points to those settlements which previously – before the Trianon Treaty of 1920 – belonged to Hungary. This sample correction provides a way of measuring the effect of common history and language in the border effect.

### 3. The research area and the available data

In my gravity approach Hungary and the neighbouring countries (Austria, Slovakia, Ukraine, Romania, Serbia, Croatia and Slovenia) are taken into consideration (*Fig. 2*). Research like this could prove the existence of a transformation process in the narrower economic space of Hungary.

Fig. 2:

### The geographic focus of the gravity approach



To conduct the research I used the nominal GDP of the countries in question between 2001 and 2011. These data were retrieved from the World Bank (WB) database. The bilateral trade data is from the United Nations Commodity Trade Statistics Database (UN COMTRADE) database. In order to calculate the intra national trade I used the approach mentioned previously: the difference between GDP and total export. When calculating the distance between countries I took into consideration the distance between the capitals. It is widely-known that the observed countries are one-centre economies where production and consumption is clustered around the capitals. To calculate the distance I used the Great Circle Distance (GCD) internet application which uses the geographical coordinates of locations. For the within country distances I used the *Leamer (1997)* method.

For the approximation method I used exclusively the STADAT database of the Hungarian Statistical Office (HSO). The previously mentioned border effect indicator was calculated by the GDP and the total and bilateral export data for the period between 2001 and 2011. Here the same geographical research area was taken into consideration as in the above mentioned case.

To test the LOOP and the transformation of Hungary's eastern borders a much larger database was required. Here I used the data of the HSO, the Ukrainian Statistical Office

(USO) and the Romanian Statistical Office (RSO).<sup>5</sup> The data contain narrowly defined consumer items and their retail prices.<sup>6</sup> With the retail prices we could record those transaction prices which the consumers had to pay, including all taxes and duties. So I do not use price indices; instead, we prefer real and absolute data which describe the real transaction prices. In addition, this method is suitable for describing the transformation process at the micro level where the basic economic interactions are taking place. I use a unique, detailed three-dimensional data panel in our research, in which 21 items and their retail prices are listed.<sup>7</sup> It must be pointed out that the list of items featuring in the research was shaped by two important factors. Firstly, the different data recording methodologies of the statistical offices had to be taken into account, and secondly, I had to find homogeneous products, not just within, but between countries as well.

These items and their prices are recorded in several stores in different administrative areas and settlements by the employees of the central statistical offices. These stores are selected centrally, taking into consideration settlement and regional level representativeness, so after calculating the arithmetical mean the retail prices are easily comparable. The transportation costs, which play a significant role in the variability of relative prices, were calculated with the help of the ArcView GIS 3.2 Network Analyst program. The distance was interpreted as the road distance between the settlements (regional centres).

The research covers the period between January 2007 and December 2011 so it comprises 60 months. It includes 11 Hungarian, 11 Romanian and 28 Ukrainian settlements (data points) (50 altogether) (Fig. 3).<sup>8</sup>

<sup>5</sup> Let me here thank Borbála Mináry (HSO), Mykola Afanasiev (USO), Maria Radulescu and Corina Maftei (RSO) for their tremendous help in collecting the data.

<sup>6</sup> In order to compare the prices we converted them into USD for which we used the official average exchange rate recorded on a monthly basis by the national banks.

<sup>7</sup> *Durable goods*: paper tissue (100 tissues), ball-point pen (plastic, with push-button, average ink), disposable plastic razor (double-edged, 5 razors), water glass (glass, 2 dl), pocket calculator (120-150 functions), peat (30 l) and wallpaper (10 m).

*Meat products*: turkey breast (fillets) and hams (without bones and knuckle).

*Other food products*: flour (1 kg), sugar (granulated, 1 kg), potato (late), milk (fresh, 2.8% fat content), eggs (10 eggs) and apples.

*Services*: fitness season ticket (10 occasions), swimming pool ticket (adult, on a weekday afternoon), taxi (5 km, city), solarium (10 min.), driving licence course (theory, practice, exam fees) men's haircut (classic, washing, cutting and drying).

<sup>8</sup> *The Hungarian settlements*: Békéscsaba, Budapest, Debrecen, Győr, Miskolc, Nyíregyháza, Pécs, Szeged, Székesfehérvár, Szolnok, Szombathely.

*The Romanian settlements*: Arad, Brasov, Bucharest, Cluj-Napoca, Craiova, Galati, Iasi, Oradea, Ploiesti, Satu Mare, Timisoara.

*The Ukrainian settlements*: Berehove, Cherkasy, Chernihiv, Chernivtsi, Dnipropetrovsk, Donetsk, Ivano-Frankivsk, Kharkiv, Kherson, Kirovohrad, Kmelnytskyi, Kyiv, Luhansk, Lutsk, Lviv, Mukacheve, Mykolaiv, Odessa, Poltava, Rivne, Sevastopol, Simferopol, Sumy, Ternopil, Uzhorod, Vinnytsya, Zaporizhya, Zhytomyr.

Fig. 3:

### The settlements used for testing the LOOP



This means that altogether in both Hungary and Romania 13,860, and in Ukraine 35,280 observations are available, which amounts to a total of 63,000 items of input data. When making settlement pairs I have 55 Hungarian, 55 Romanian and 378 Ukrainian observations and in a single month 1,155 Hungarian, 1,155 Romanian and 7,938 Ukrainian data are at hand. In the case of cross-country analysis, in the Hungarian–Romanian relationship 2,541 and in the Hungarian–Ukrainian relationship 6,468 city pairs are available in a single month. So to understand the transformation process of the eastern borders of Hungary – taking all data and the five-year time frame into account – I have altogether 152,460 (Hungary–Romania) and 540,540 (Hungary–Ukraine) observations.

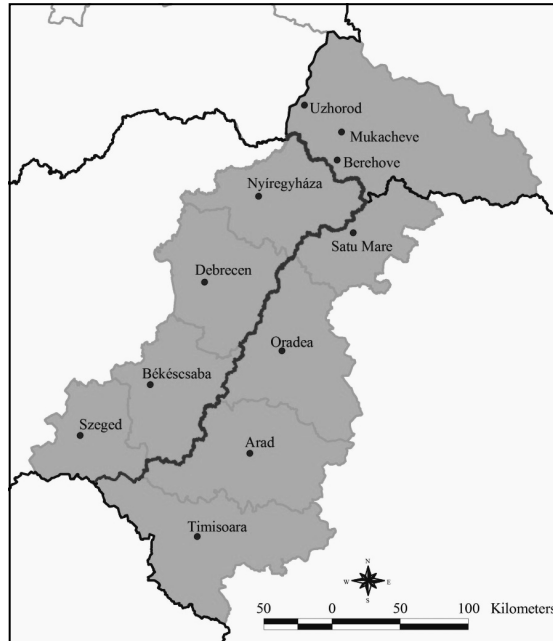
With the determination of the previously mentioned narrowly defined research area (Fig. 4) the micro and individual level effect of the transformation process can be better understood. In this research area those spatial units and settlements are represented in which everyday life is largely influenced by the national borders.<sup>9</sup>

<sup>9</sup> In order to conduct a micro area research we selected the following settlements. Hungary: Békéscsaba, Debrecen, Nyíregyháza, Szeged. Romania: Arad, Oradea, Satu Mare, Timișoara. Ukraine: Berehove, Mukacheve, Uzhgorod.



Fig. 4:

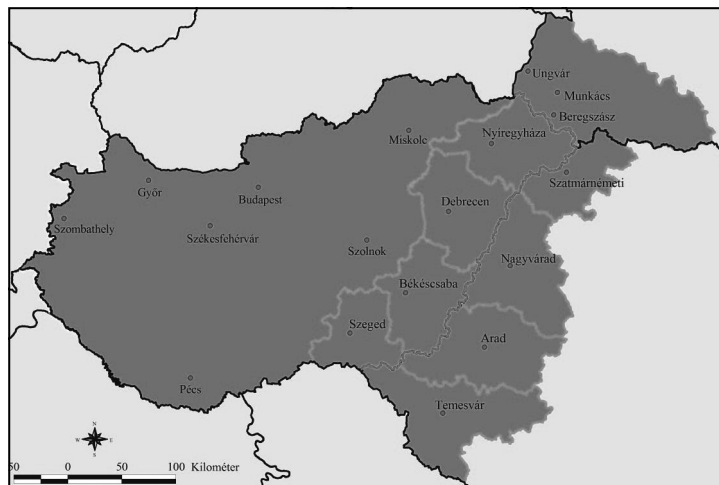
**The micro region used for testing the LOOP**



Finally, as a last development I intended to evaluate the previous spatial coherence so I restricted the Ukrainian and Romanian data points to the marked settlements in Fig. 5, without amending the Hungarian dataset.

Fig. 5:

**The research area used for testing the previous territorial coherence**

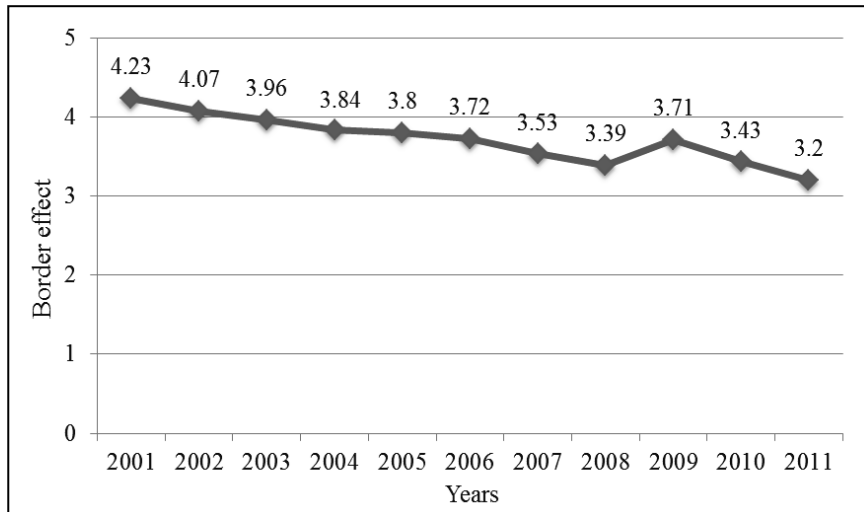


#### 4. Main findings

The gravity approach verifies the transformation process and the effect of borders in shaping economic interactions. The fit ( $R^2$ ) of the model proved to be around 90% in every single year, so with the strong correlation between the variables, the volume of trade could be explained. The volume of trade was influenced negatively by distance, and positively by economic potential and adjacency. As we have already mentioned, among the parameters the *home* variable  $\beta$  value was the most interesting. It became significant at 1% in every year and showed a declining trend (Fig. 6). The 4.23 value measured in 2001 means that an average country in the research area traded 67.71 times more within its borders than with another country. In the following years we could observe a steady decline in the case of the parameter  $\beta$ , and by 2011 the difference between internal and external trade had dropped to 23.53.

Fig. 6:

**The border effect indicator according to the gravity approach (2001-2011)**



Source: World Bank (2001-2011), UN COMTRADE (2001-2011), GCC (2013)

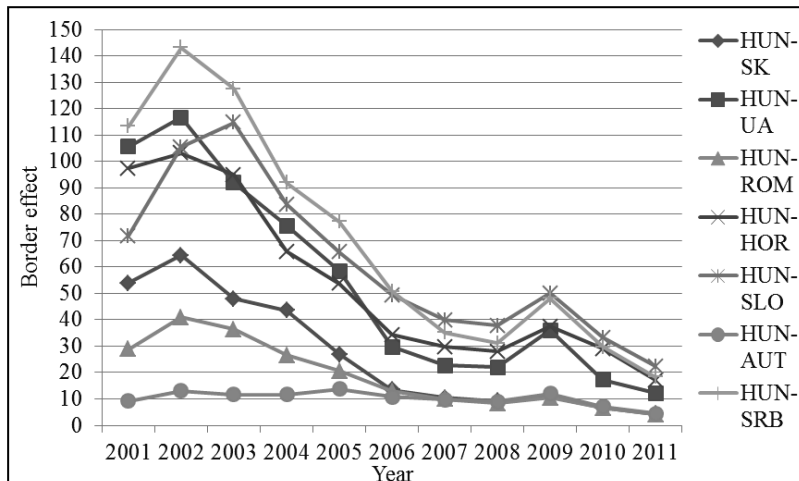
These results enabled me to draw some valuable conclusions. First of all, in economic terms the restricting effect of the borders is easily specified, so despite the forces of globalisation, the European and world economy integration tendencies etc., the state borders still shape the cross-country economic interactions. It is true, however, that in the period between 2001 and 2011 the transformation process showed spectacular results. This tendency proved to be significant despite the fact that some countries in the research area are still outside the EU and do not use the common currency, the euro. According to Fig. 6, the EU membership of Hungary, Slovakia and Slovenia in 2004 did not create any direct effect on the transformation process because the dynamics of the phenomenon did not change after these countries had achieved full integration. As a matter of fact, the same is true for the 2007 enlargement round and the enlargement

of the Schengen Zone. It is quite interesting that the financial and economic crisis of 2008 has had a direct effect – owing to the decreasing export volumes – on the transformation process, resulting in increased border effect indicators. It is also true however, that these numbers dropped to previous levels. I do not intend to give a detailed analysis on the effect of crises on the transformation process; however, I firmly believe that crises, accompanied by dwindling export volumes and faltering import demand, have a clear negative effect on the dynamics of transformation.

As previously mentioned, I measured the results of the transformation process along the Hungarian borders by one of the methods of approximation. According to Fig. 7, the border effect is palpable in every Hungarian border and, in accordance with the gravity approach, shows a clearly negative tendency between 2001 and 2011. While Hungary traded 68.6 times more within her borders on average in 2001, by 2011 this value had dropped to 11.83. The figure indicates that along the Hungarian borders two well-defined groups have been formed, so the transformation process was strongly asymmetric. The first group includes those countries (Austria, Romania, Slovakia) where the border effect is perceptibly lower. Among the possible reasons for this the following factors could be mentioned: European integration tendencies, longer borders with several border crossing points (Romania, Slovakia), higher economic integration with significant absorbing potential (Austria), capitals and central regions closer to the borders (Austria, Slovakia). The second group is characterised by those countries (Serbia, Ukraine, Slovenia, Croatia) where the border effect indicator is markedly higher. We can also point to some explanatory factors in this case: shorter borders with limited border crossing points, lower economic integration, capitals and central regions far from the borders, generally lower world economy embeddedness, external Schengen Zone status (three countries belong to this category from the group).

Fig. 7:

**The border effect along the Hungarian borders (2001-2011)**



Source: HSO (2001-2011)

The figures indicate that the EU integrations of 2004 and 2007 did not bring spectacular changes because the main tendencies had put down roots well before these years. The same is true for the opening up of the Schengen borders, while the crisis of 2008 largely distorted the process.

As for the eastern borders of Hungary, it is clear that the Hungarian–Ukrainian and the Hungarian–Romanian borders are not homogeneous. According to 2011 data, in the Hungarian–Ukrainian case the detectable border effect indicator was 4.07 times higher and in the Hungarian–Romanian it was 12.16 times higher. As a consequence a more detailed analysis could shed more light on these differences.

Testing the LOOP in the Hungarian–Ukrainian and in the Hungarian–Romanian relationships confirms the results of the approximation method: the transformation process showed diverse dynamism and features in the two cases. Generally, the variability of the relative prices is indeed lower in within country comparison than in the cross-country case. However it is not true for the ball-point pen, the pocket calculator and the swimming pool ticket in the Hungarian–Ukrainian relationship. In the other relationship the same items and also the wallpaper, the fitness season ticket and the solarium are the exceptions. This means that in the former case every product group shows larger cross-country standard deviation, while in the latter case the durable goods and the services are exceptions. The standard deviation is 0.2479 in the Hungarian–Ukrainian relationship and 0.1941 in the Hungarian–Romanian one. This difference (almost 30%) in itself confirms the conclusions of the method of approximation. A further interesting fact emerges, since in both relationships the standard deviation of durable goods and locally produced services is higher than the two food industry product categories. This can be extremely interesting in the context of the general presumption that the prices of traded goods show a much lower standard deviation over time. *Sanyal and Jones (1982)*, however, pointed to the fact that behind the higher standard deviation, the higher ratio of locally produced inputs could also play a role. Nonetheless, it is quite interesting that in the three countries the food industry products (other food industry products and meat products) show the lowest within country standard deviation.

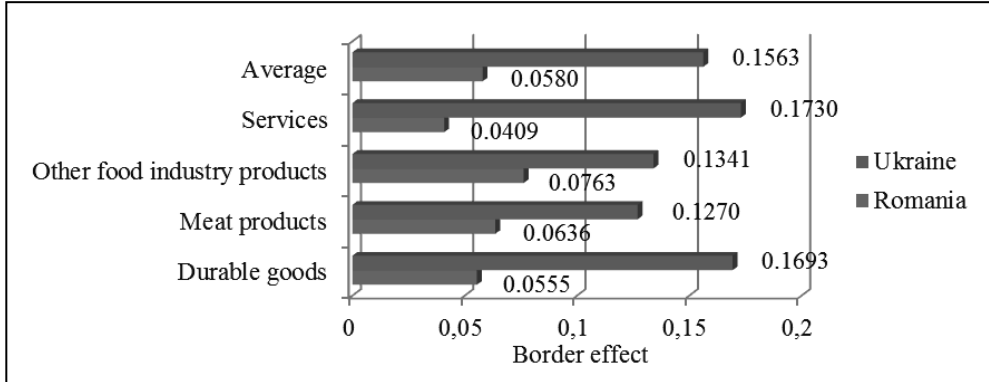
In the case of a micro region analysis we can draw almost the same conclusions: the Hungarian–Ukrainian relationship shows a value of 0.2151 and the Hungarian–Romanian relationship a value of 0.1476. Both values are lower than the macro level results; however, the higher cross-country standard deviation is still clear. This obviously points in one direction: behind the greater price variability, the border, with its special economic interaction shaping feature, has a massive role.

In order to acquire a more nuanced picture of the role of borders, I dissolved the within and across country standard deviations (8). According to the results, in the Hungarian–Ukrainian relationship the border effect is strong and permanent because the parameter  $\beta_1$  was positive in every case and remained significant at 1%. Taking all products into consideration, we calculated a strong, 0.1563 border effect indicator, which means that the standard deviation of cross-country data points increased by 16.92% compared to a within country case. Apples produced the lowest value (0.0595), while the highest was recorded for sugar (0.2693). In the Hungarian–Romanian context the border effect is also existent but the parameters for milk and the solarium were not significant (the other parameters were significant at the 1% level). The average

value of the border effect was “just” 0.0580 which means that the border increases the standard deviation by 5.97%. The lowest value was calculated in the case of the fitness season ticket (0.0323) while the highest was for potatoes (0.1280).<sup>10</sup> When we compare the two relations (*Fig. 8*) we can easily detect the heterogeneity of the border effect.

*Fig. 8:*

**Proving the border effect along the eastern Hungarian borders (2007-2011)**



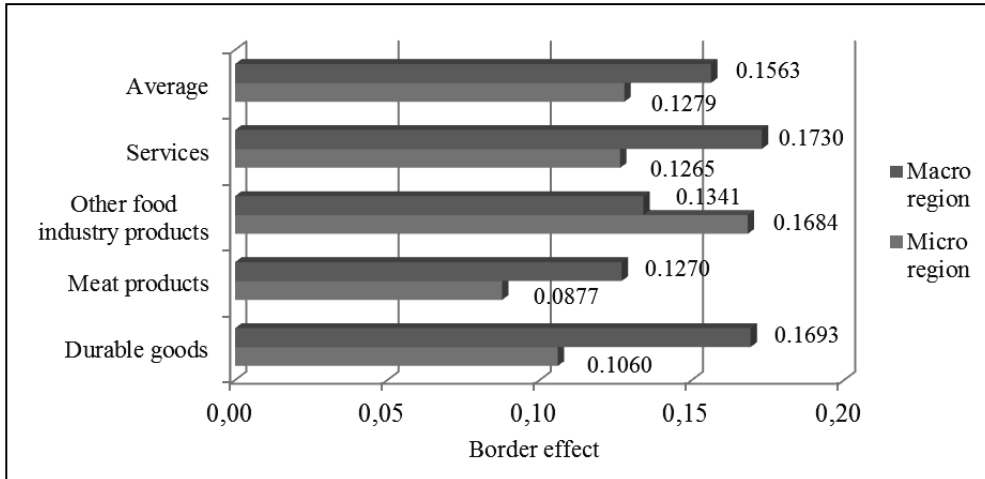
Source: HSO, RSO, USO (2007-2011)

According to the results, a border effect approximately 3 times higher can be observed in the case of the Hungarian–Ukrainian border than in the Hungarian–Romanian case. This diverse trait raises two highly interesting questions. First of all, the determination of the explanatory factors and secondly, the macro and micro level differences of the border effect. In the case of micro level research we must draw the following initial conclusion: the isolating feature taking shape in the border effect is palpable at the micro level as well.

<sup>10</sup> Here I would like to draw the reader’s attention to an interesting feature. In some cases the regression results produced negative distance parameters, which indicates that with the increase in distance the standard deviation of cross-country data pairs decreases. This obviously contradicts the findings of *Engel and Rogers (1996)* and *Horváth et al (2008)*. Behind the negative parameters there is a special economic-geographic explanation. In the countries in question the neighbouring borderlands are peripheries, while the distant central regions show high economic integration; these are natural production spatial units (*Baranyi, 2007*). As a consequence, in the price of products purchased in border regions a larger transportation cost is reflected so, *ceteris paribus*, the central region-central region comparison (larger distance) definitely results in a lower standard deviation than the central region-borderland case.

Fig. 9:

**The border effect of the Hungarian–Ukrainian border at the macro and micro level (2007–2011)**



Source: HSO, USO (2007–2011)

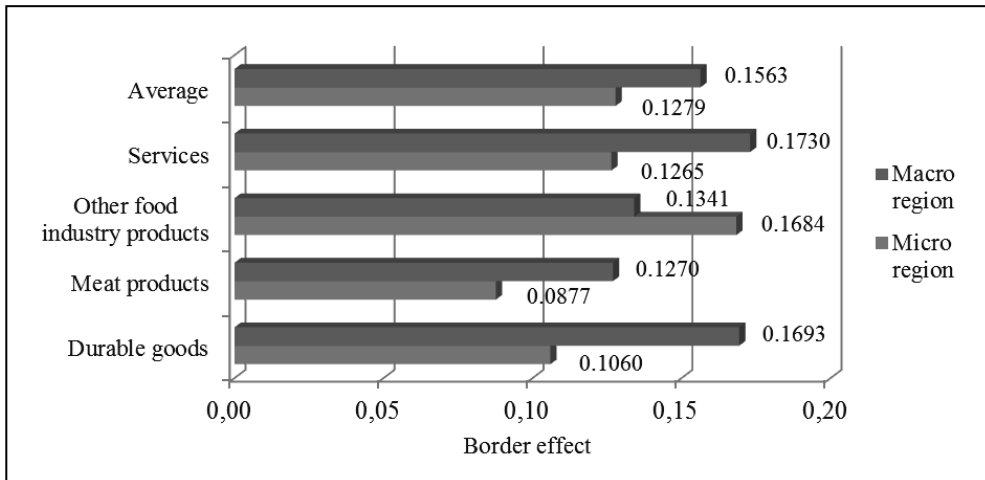
In the Hungarian–Ukrainian relationship (Fig. 9) I measured 0.1279 (a 13.64% increase in standard deviation) and in the Hungarian–Romanian one 0.0547 (5.62%) (Fig. 10). These data are slightly lower than those calculated at the macro level; the difference however remains below 20% and 10%, respectively. This led me to draw the conclusion that those who live in borderlands are slightly better affected by the transformation process, but their economic interactions are still significantly affected by the presence of the state borders. The values of the parameter  $\beta_1$  in the Hungarian–Ukrainian relationship are almost the same as at the macro level. However, peat and the swimming pool ticket are not significant at 1%. The lowest border effect was recorded in the case of peat (0.0561) and the highest was for sugar (0.2531). It is also interesting to point to the fact that it was only the other food industry category which produced products (milk, eggs, apples, potatoes) where the border effect was larger than at the macro level.

The Hungarian–Romanian micro area has a special feature, namely that the border effect indicator for the pocket calculator, the peat, and the solarium did not prove to be significant. In addition the pocket calculator showed a negative value (–0.0011).<sup>11</sup> In comparison with the macro area, the border effect indicator at the micro level was once below and once above the values. The lowest parameter was 0.0215 in the case of milk; the highest (0.1097) was recorded for potato prices.

<sup>11</sup> This is not surprising at all because it simply means that buying on the other side of the border is systematically cheaper than at home.

Fig 10:

**The border effect of the Hungarian–Romanian border  
at the macro and micro level (2007-2011)**



Source: HSO, RSO (2007-2011)

Subsequently, I tried to discover the factors which contributed to the existence of the border effect. First, I took into consideration the effect of common language and economic history. By restricting the Ukrainian sample to three, and the Romanian sample to four, settlements, I expected a lower border effect indicator due to the common past. However the results did not verify the total disappearance of the parameter  $\beta_i$ . In the Hungarian–Ukrainian case I detected 0.1188 (a 12.61% standard deviation increase) which means that the isolating features of the borders are still palpable and it is not only the foreign language which is responsible for the existence of the border effect. In addition, the border effect was present in those territories which previously belonged to the same country. The parameter  $\beta_i$  was significant in every case and except for potatoes, flour, eggs and apples every product showed a lower border effect than at the macro level.

The Hungarian–Romanian relationship showed the same pattern as far as the impact of the common language and history are concerned. The general border effect was lower (0.0477, a 4.89% increase in standard deviation) and the pocket calculator, peat, wallpaper and solarium were not significant. In the case of the other products, a decline in the macro level values could be detected. In simple terms, this relationship confirmed our previous finding: the border effect is not only caused by the different languages spoken, and it exists in previously united spatial units as well.

Finally I evaluated the role of the nominal exchange rate in the values of parameter  $\beta_i$ . My hypothesis was that the border effect is caused by the different inflation rates of the countries involved. The results contradicted this. In the case of the Hungarian–Ukrainian border the parameter was 0.1555 (a 16.82% increase in the standard deviation) which strongly confirmed that the border effect is not just the result of the fluctuation of the nominal exchange rate. In the Hungarian–Romanian case I calculated

0.0586 (a 6.04% increase in the standard deviation) which made it clear that along the eastern borders of Hungary it is not the nominal exchange rate which is responsible for the existence of the border effect.

## **5. Conclusions and discussion**

The paper has clearly and consistently pointed to the existence of the border effect in the CEE region and in Hungary. According to the gravity approach, the role of borders is still strong in shaping the economic interaction; however, this role is fading with time. In 2001 the CEE countries were less open to trade and they traded 68 times more within their borders. By 2011 this indicator had dropped to 23, indicating the above mentioned tendencies.

The border effect is clear along the Hungarian borders but, in accordance with the general tendency, it weakened between 2001 and 2011. The transformation process, however, shows large heterogeneity, since two different groups of countries can be detected. The Hungarian–Austrian, the Hungarian–Slovakian and the Hungarian–Romanian relationships show a systematically lower indicator than in the Hungarian–Slovenian, the Hungarian–Serbian, Hungarian–Croatian and the Hungarian–Ukrainian cases. So the disappearance of borders and their economic effects are quite varied along the Hungarian borders. When checking the tendency of the indicator it became clear that membership of the EU and of the Schengen Area have spurred openness and the transformation process, but did not bring direct changes immediately after the accession dates. (The actual realignment had taken place well before the official accession dates.) The financial and economic crisis of 2008 has had a clear and direct negative effect on the transformation process, so the protective umbrella of the EU and the internal market has proved to be insufficient.

My micro level analysis strongly confirmed our previous findings. The Hungarian–Ukrainian and the Hungarian–Romanian borders have undergone a quite different transformation process, which results in perceptible differences and heterogeneity. Thanks to European integration, closer trade links and various other factors, the Hungarian–Romanian border is more permeable and its role in shaping the economic interactions is disappearing. The transformation process is also detectable at the micro level with a slight difference. This clearly indicates that individuals residing close to the border are affected by the changing borders.

All in all, these patterns in the case of the eastern borders of Hungary point to the fact that while in the Hungarian–Romanian relationship the disappearing borders have been able to pave the way for more intense economic interactions and development, the Hungarian–Ukrainian borderland is facing great challenges. Here globalisation and European integration tendencies are not so pervasive, so the basis for increased cross-country economic links is partly, or to be more exact, mostly, missing.



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Domicián Máté

## Sectoral Features of Economic and Employment Growth in Various OECD Countries

### Introduction

The contribution of labour to economic growth became especially popular in historical research after the rise of human capital theories advocated by *Becker (1964)* and *Schultz (1961)* and growth theories first formalised by *Solow (1956)*. Later, *Nakamura (1981:263)* defined human capital as 'labour skills, managerial skills, and entrepreneurial and innovative abilities - plus such physical attributes as health and strength'. Meanwhile, the early years of 1970s, and, later the oil crisis eventually revealed that it takes more than just physical and human capital to generate economic growth (*Földvári – Leeuwen 2007*). This made it possible to introduce human capital into new theories dealing with economic growth.

In the first human capital augmented models, pioneered by *Lucas (1988)*, human capital was inserted as a factor of production similar to physical and labour accumulation. A consequence of this extension of the original Solow-model was that GDP growth was positively influenced by human capital (HC). Human capital, in this approach, is exemplified as skills, which are embodied in a worker and are also a rival and excludable good (*Barro–Sala-i-Martin 2004*). In another model, pioneered later on by *Romer (1990)*, the neo-classical growth model is followed in the sense that technological growth works on GDP growth through the level of human capital. In this case HC produces new technologies directly because it is used as an input in R&D related activities and is visible in the skills (knowledge and ideas) of a worker. Consequently, in the latter case HC is non-rival and partly-excludable.

Recently, there have been serious debates attempting to explain how HC might influence productivity. Meanwhile, the effect of human capital on economic growth is usually reflected in low positive and significant coefficients (*Barro–Lee 1993*), (*Cohen–Soto 2001*) etc., except in the famous study of *Benhabib and Spiegel (1994)*. Thus, empirical results found that investment at the level of education, *ceteris paribus*, might not produce economic growth (*Gwartney et al. 1999*).

The purpose of this research study is to investigate the valid relationships between employment, physical capital accumulation and productivity growth. In my hypothesis,

I assume that productivity growth varies in the performance of different labour-skilled employees. The rest of this study is structured as follows. In the next sections I describe the features of output and employment growth with common descriptive statistics. In my estimations I follow a specific taxonomy to identify the characteristics of output and employment growth tendencies in different labour-skilled branches over the previous decade. Then, I demonstrate a dynamic regression model with cross-industry panel data in order to investigate how employment affects economic growth per capita. The study ends with some policy implications and a conclusion. My motivation is not only to suggest feasible point of reference for policymakers to enhance better productivity growth performance in different sectors, but also to outline further research directions in this sectoral perspective.

### **Industry structure analysis and taxonomy**

A unique database has been constructed for the analysis of economic and employment growth by the EU KLEMS (2003) Project. This project aims to create a database which include measures of economic growth, productivity, employment creation, capital formation and technological change at the industry level for various OECD countries from 1970 onwards. The last (March 2011) release of KLEMS database provides data up to 2007 for a limited set of variables in different industries. Hence, in our estimations we should expand the given time series of gross value added<sup>1</sup> (GVA) in constant (1995) prices and numbers of persons engaged in 56 separate industries<sup>2</sup> to calculate economic and employment growth performance. In my dynamic model specification I also need the share of investment within output for each OECD country, which is available from the Penn World Table, included in *Heston et al. (2006)*.

In my estimations I followed a specific taxonomy that was introduced by *van Ark et al. (2003)* to identify the features of output and employment growth tendencies. This approach focused on labour skills and was defined by educational attainment. However, the taxonomy distinguishes four groups ranging from high to low-skilled intensive branches. The skill levels in Eurostat are based on the International Standard Classification of Education - 1976 (from ISCED 0 to 6). The table below lists the industries divided into four different groups:

<sup>1</sup> Gross value added (GVA) is a measure used in economics as the value of goods and services produced in an area, industry or sector. Gross value added is equivalent to output (GDP) less intermediate consumption.

<sup>2</sup> Industries were separated by Indicators of activities for Industry and Services, based on ISIC Rev 3.

Table 1.

**Skill taxonomy of all industries (with ISIC Rev 3.)**

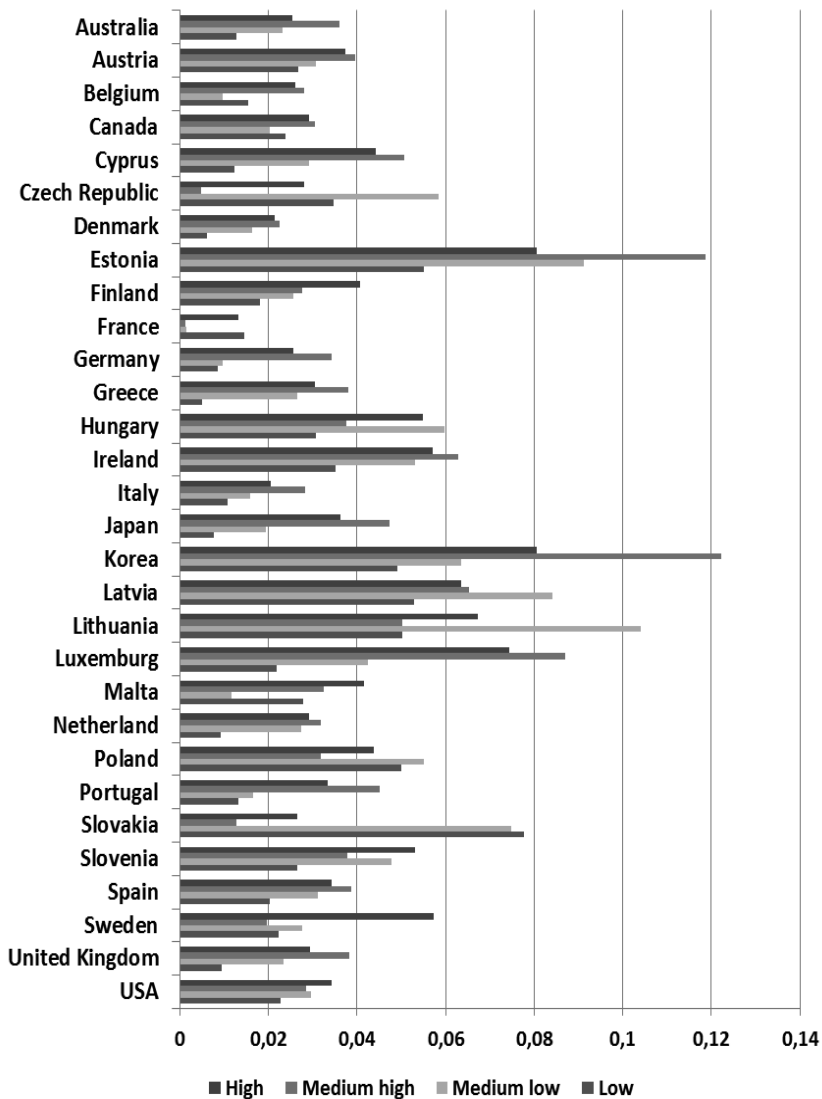
<p>1. <i>High skilled (HS)</i>: Mineral oil refining, coke and nuclear fuel (23); Chemicals (24); Office machinery (30); Radio, television and communications equipment (32); Electronic valves and tubes (321); Telecommunication equipment (322); Radio and television receivers (323); Financial intermediation (65); Insurance and pension funding, except compulsory social security (66); Activities auxiliary to financial intermediation (67); Real estate activities (70); Computer and related activities (72); Research &amp; development (73); Other business services (74); Public administration and defence; compulsory social security (75); Education (80).</p>
<p>2. <i>High-intermediate skilled (HIS)</i>: Medical, precision &amp; optical instruments (33); Scientific instruments (331); Other instruments (33-331); Other transport equipment (35); Building and repairing of ships and boats (351); Aircraft and spacecraft (353); Railroad equipment and transport equipment (352+359); Electricity, gas and water supply (40-41); Air transport (62); Supporting and auxiliary transport activities; activities of travel agencies (63); Communications (64); Renting of machinery &amp; equipment (71); Health and social work (85).</p>
<p>3. <i>Low-intermediate skilled (LIS)</i>: Wood &amp; products of wood and cork (20); Pulp, paper &amp; paper products (21); Printing &amp; publishing (22); Fabricated metal products (28); Mechanical engineering (29); Electrical machinery and apparatus (31); Insulated wire (313); Other electrical machinery &amp; apparatus (31-313); Construction (45); Sale, maintenance and repair of motor vehicles and motorcycles; retail sale of automotive fuel (50); Wholesale trade and commission trade, except of motor vehicles and motorcycles (51); Retail trade, except of motor vehicles and cycles; repair of goods (52); Inland transport (60); Water transport (61).</p>
<p>4. <i>Low skilled (LS)</i>: Agriculture (01); Forestry (02); Fishing (05); Mining and quarrying (10-14); Food, drink &amp; tobacco (15-16); Textiles (17); Clothing (18); Leather and footwear (19); Rubber &amp; plastics (25); Non-metallic mineral products (26); Basic metals (27); Motor vehicles (34); Furniture, miscellaneous manufacturing; recycling (36-37); Hotels &amp; catering (55); Other community, social and personal services (90-93).</p>

Source: van Ark et al. (2003:60-61).

The purpose of this section is to describe the demand structure of industries in the OECD. This section looks at economic performance in the EU-25 and four other OECD countries contrasted with the USA during the periods between 1980 to 2007. My analysis begins with an examination of value added, which is one of the indicators most readily associated with increases in output growth. Economic growth is defined here as the growth of Gross Value Added at constant prices. The average growth rates in the four different labour-skilled branches of the examined countries are shown in Figure (1).

Figure 1.

**Average economic growth rates of OECD countries, 1980-2007\***



Source: own calculation based on EC KLEMS (2013).

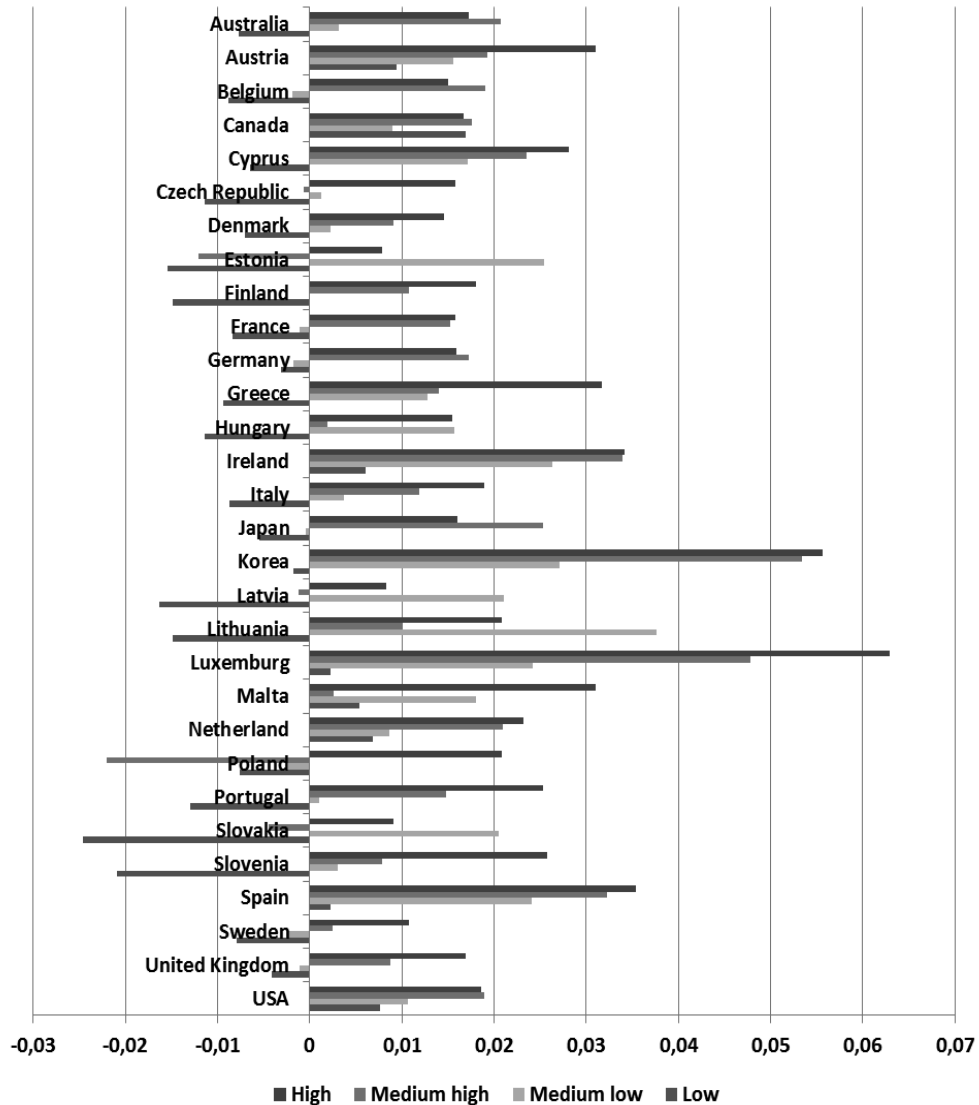
Notes: \*1995-2007 at CYP, CZE, EST, HUN, LTU, LTV, MLT, POL, SLK, SLV.

As Figure 1 suggests, the greatest growth in value added occurred in most of high and high-intermediate (HS and HIS) skilled branches and the lowest rate of growth was typical in the low-skilled (LIS and LS) industries. Obviously, cross country variation ranged from 1% to 12%. Although growth rates vary substantially across countries, the rates of output growth are roughly constant over long periods of time in all

branches. In some other EU member countries there was a much larger proportion of value added in high-skilled industries than with the USA averages, except for the economic performance of the Czech Republic and Slovakia, where machinery and vehicle industries improved more markedly than the high skilled industries in the period 1995-2007.

Figure 2.

**Average employment growth rates of OECD countries, 1980-2007\***



Source: own calculation based on EC KLEMS (2013).

Notes: \*1995-2007 at CYP, CZE, EST, HUN, LTU, LTV, MLT, POL, SLK, SLV.

Figure 2 reflects employment growth rates in the same industries and time periods. Here similarities appear in the performances of each sector and over time. The average annual employment growth rates in HS and HIS branches, in all examined countries, were greater than in the lower skilled ones. Furthermore, I should also mention that employment growth was controversially negative in several low-skilled (LS) industries, as it was in the USA.

Industry structure should be described by using the distribution of value added and employment to the aggregate level of OECD countries. Table 2 represents value added and employment shares of the aggregate OECD performance over three years (1980, 1995 and 2007). In the OECD countries, in 1980, the major proportion of economic growth stemmed from the LS and LIS sectors, but particularly by 2007 the high-skilled sectors were already enjoying the highest level of growth. Although, the total distribution position differs across the OECD, we can conclude that the high-skilled branches have achieved better economic growth than the lower ones. When I estimate employment performance, the same tendencies in sectoral shifts also seems to occur. From 1980 to 2007 in HS and HIS branches the employment share obviously increased, but the decreasing employment of low-skilled workers was still higher than in our estimations.

Table 2.

**Output (GVA) and employment distribution (%) of OECD countries in each labour skilled sector, 1980-2007**

GVA	High	Medium high	Medium low	Low
1980*	32.60%	8,17%	31,87%	27,36%
1995	36.56%	9,96%	32,25%	21,23%
2007	43.39%	14,52%	24,75%	17,34%
Employment	High	Medium high	Medium low	Low
1980*	24.96%	12.24%	32.90%	29.91%
1995	28.88%	13.83%	31.65%	25.64%
2007	31.86%	15.09%	29.87%	23.18%

Source: own calculation based on EC KLEMS (2013).

Notes: \*except CYP, CZE, EST, HUN, LTU, LTV, MLT, POL, SLK, SLV.

**Dynamic productivity changes: the econometric evidence**

Now, let me start by initiating an empirical investigation to test what kind of relationship exists between labour productivity (GVA per capita) and employment. Here, following the mainstream economic growth literature I choose a well-known conditional convergence model specification previously promoted by *Barro and Sala-i-Martin (1997)*. The growth formula in the standard model can be written as:



$$\frac{\dot{y}_i}{y_i} - \gamma = G \left[ \frac{y_i}{y}, \left( \frac{y_i^*}{y} \right) \right] \quad (1)$$

The partial derivatives of function  $G$  satisfy  $H_1 < 0$  and  $H_2 > 0$ . The value  $[y]$  represents productivity growth in a follower country  $[i]$ . The long run steady state output per capita value  $[y^*]$  depends on the neoclassical parameters, such as government policies, willingness to save etc. Consequently, higher values of these factors might increase  $[y^*]$ .

In Equation 1  $[\gamma]$  is the growth rate of a leading economy, which could be identified as the average growth rate of output per worker in a set of advanced countries. In my estimations I choose the USA, as the technology-leader country. Furthermore I assume that all followers have the same leaders. Hence, the cost of mitigation and rates of technological change should be exactly the same for all follower countries. The conditional convergence can be measured in this case with the variation of  $(y_i/y)$ , as the ratio of the follower's output per worker divided by the USA's productivity performance for the same year.

Descriptive analysis is only able to detect the direct contribution of the structural shifts at industry level to aggregate economic and employment growth performance. After having demonstrated the existence of a systematic relationship between the industrial structure of labour and economic growth, I will examine the impact of employment on economic growth per capita. Taking into account new endogenous growth theories my model specification includes the lagged dependent variables among the repressors<sup>3</sup>. However, unlike the neo-classical approach long-run economic growth should be determined within the models rather than being exogenously assumed (Czeglédi 2010). A dynamic specification requires the special instrumentation of these lagged endogenous variables, for which we engaged the empirically offered GMM estimators developed by Arellano and Bond (1991). These methods employ lagged levels of the dependent and predetermined variables, as well as differences between the exogenous variables as instruments.

In my dynamic model specification the economy tends toward long run equilibrium. The extent of economic growth generally affects the rate at which per capita output approaches its steady state value. After taking the first difference of the dependent variable, our basic model assumes the following formula, which is tested in each of the different labour skilled sectors:

$$\Delta \ln Y_{it} = \beta_0 + \beta_1 \Delta \ln Y_{it-1} + \beta_2 \ln(INV)_{it} + \beta_3 \ln(n + g + \delta)_{it} + e_{it} \quad (2)^3$$

The dependent variable  $[Y_{it}]$  is the ratio of real GVA per capita of a follower country and the output of the USA  $(y_i/y)$  for the period  $[t]$  and country  $[i]$  at a constant price (1995). The first independent variable refers to the lagged productivity growth and the next variable represents the share of investment  $[INV]$  within sectoral output in each country. Thus,  $[n]$  is the average growth rate of labour and the addition of long

<sup>3</sup> Note:  $\Delta$ var - variable in first differences,  $\Delta$ var<sub>t-1</sub> - lagged differences,  $\ln$  - in logarithm.

run technological growth and depreciation rates  $[g]+[\delta]$  are assumed to be constant (0.05), as in *Mankiw et al. (1992)*. Finally,  $[e]$  is the error term.

Long run GVA per capita, investment and engaged employment variables are available between 1980 and 2007 from the databases. Moreover, the cross country panel data are generated by the five year averages of 1980, 1985, 1990, 1995, 2000 and 2005. All in all, we have an unbalanced panel of 29 countries to evaluate the relationship between employment and long run GDP per capita in four different labour skilled sectors.

Table 3 represents the corresponding results of my estimations. Although, the two-step GMM estimator should be theoretically preferred experimentally, both procedures appear to produce similar outcomes, so I only present the first one results. At the bottom section of the table can be seen the common results of AR(1) and Wald tests to demonstrate the lack of autocorrelation and over-identifying restrictions. The significance levels of the tests in all models suggest that the dynamic specification should be preferred.

Table 3.

**Dynamic panel regression of real GDP (GVA) per capita,  
1980-2007**

Dependent variable: $\Delta \ln(Y)_{it}$				
Independent variables	High	Medium high	Medium low	Low
constant	0.0109 (0.64)	<b>0.05826</b> (2.92)**	0.0052 (0.49)	<b>0.0258</b> (1.96)**
$\Delta \ln(Y)_{it-1}$	-0.292 (-1.13)	<b>0.4568</b> (3.86)*	<b>0.2899</b> (1.86)*	<b>0.2202</b> (1.54)*
$\ln(INV)_{it}$	<b>0.0922</b> (1.59)*	<b>0.2247</b> (2.38)**	<b>0.4058</b> (5.17)***	<b>0.1368</b> (2.02)**
$\ln(n_i+g+\delta)_t$	<b>-0.5006</b> (-2.70)***	<b>-1.0086</b> (-5.81)***	<b>-0.5644</b> (-4.49)***	<b>-0.5244</b> (-4.04)***
Number of observations	78	78	78	78
Number of countries	29	29	29	29
Number of instruments	6	6	6	6
Wald-test	(9.72)***	(41.43)***	(41.81)***	(39.45)***
AR-test	(-2.83)***	(-2.43)***	(-3.45)***	(-3.35)***

Source: own calculation based on EC KLEMS (2013) and Heston, Summers and Aten (2006) databases.

Notes: \* Heteroscedasticity robust z-statistics are in parentheses. Letters in the upper index refer to significance: \*\*\*, significance at 1 per cent, \*\*, 5 per cent, \*, 10 per cent. P-values without an index mean that the coefficient is not significant even at the 10 per cent level.

The impact of the lagged GVA per capita, however, is not robust in the high-skilled (HS) sectors<sup>4</sup>, although in the other branches there are significant positive z-statistics. This relationship, *ceteris paribus*, implies the existence of convergence among the leader and follower countries. Moreover, I also claim that the impact of the convergence on productivity depends on the labour intensity of each sector. In other words, the higher the skill level of a sector the more the GDP per capita growth. According to the neoclassical growth theories an increase in the share of investment within output acts pro-cyclically and has a positive effect on productivity growth. Thus, in my results, the employment growth attainment is negatively related to the growth of per capita output in long run. Hence, employment is controversially correlated with productivity growth. Moreover, the effect of labour accumulation on productivity growth does not seem to be large in both sectors. The coefficients range from circa -0.5% to -1%. Obviously, if employment increase the high-skill intensive (HS) branches might affect productivity least of all.

## Conclusions

In this study two objectives were declared. My first objective was to analyse economic growth and labour productivity tendencies for the period 1980-2007 in various OECD countries. The industrial structure was described by the distribution of value added and employment growth. From my empirical results I claim that in all of the OECD countries the highest growth rate of output was in the high-skilled industries. The average annual employment growth rates in the (HS) and (HIS) branches were higher than in the lower skilled (LIS and LS) sectors. This anticipates the increasing role of human capital in labour demand. In the EU-15 countries the highest proportion of economic growth stemmed from the (HS) sectors, and the employment share in these branches obviously increased, but in the (LS) sectors it decreased in the EU member countries as well.

The second objective was to examine the relationship between physical capital, employment and productivity growth. The impact of the lagged output per capita resulted in a positive and significant z-statistics, which implies the existence of convergence among the leader and follower countries. Thus, the speed of convergence depends on the labour intensity of each sector. My results also show that an increase in the share of investment within output acts pro-cyclically and has a positive effect on productivity growth. Moreover, my dynamic panel regression model yields a valid negative relationship between labour and productivity growth in long run. All in all, I found that the high-skill (HS) intensive branches might affect productivity growth least of all.

As a consequence, I consider the following government policy suggestion for policy makers from my model representation. Given that mainstream macro policies aim to promote stable long run economic growth, it is recommend assisting the high-

<sup>4</sup> Lack of significance means that changing investment does not indicate productivity growth in this branch, at a given level of output per capita and other determinants.

skilled employment branches if this affects the basic economic demand structure. In particular, my analysis suggests that policy makers must try to increase the degree of competition in labour markets; i.e. by motivating skilled workers to learn more for better productivity growth.

From this perspective an additional research direction has emerged in this study. I argue that the human capital theoretical perspective is relevant since it extends the achievements of macroeconomic growth theories. Although, these approaches state that labour highly correlate with output growth, but there is currently no unambiguous evidence to identify the valid relationship between human capital, institutions etc. in different labour-skilled sectors. Hence, further research in these diffusion approaches could be fruitful.

### Acknowledgement

This research was realized in the frames of TÁMOP 4.2.4. A/2-11-1-2012-0001 „National Excellence Program – Elaborating and operating an inland student and researcher personal support system” The project was subsidized by the European Union and co-financed by the European Social Fund.”

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