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SYSTEM ARCHETYPES IN SELECTED PROCESSES OF ECONOMIC INTEGRATION

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Abstract

The field of economic integration processes requires a systems approach in order to understand behavior in complicated situations. Our aims are to recognize better structures which are not evident, as well as those that are fundamental for understanding complex situations. The goal of this contribution is the mapping of system archetypes, including their mutual interdependencies found within the processes of economic integration. We will focus on structures that can be found in the integration process of free movement of persons, also known as the labor force. It will be shown how these repeating structures - system archetypes - can make the study of complex integration processes easier, and can be a key to understanding limits in their functioning.

Key Words

System Thinking, System Archetypes, Economic Integration, EU Internal Market, Labor Forces

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Introduction

This paper is focused on a new approach of how to examine integration processes, specifically in the field of economic policy. This field has previously been approached only with relatively simple quantitative tools and methods. There were prevailing microeconomic issues based on theory of preferential trade liberalization, combined with theory of market structures (including the Nash equilibrium in Cournot model) and economy of scale in this research. Some macroeconomic approach has been used in studies of integration of national labor markets (Baldwin 2008). Results have been equal to these methods. Emphasis has been put on the examination of parts while almost ignoring the complexity of the processes. We can say – with great simplification – that research of economic integration has hit the methodological ceiling. Overcoming this situation is a scientific problem. That is why we decided to test a hypothesis: Is it possible to apply a system approach on processes of integration?

We start with analyses of the behavior of people (labor force), companies, and governments in integration of national labor markets. We derive more general model of behavior and compare it with system archetypes behavior. So we can say that we are testing applicability of system archetypes in research of economic integration. Except for the area of labor market integration, some other areas of integration are only mentioned.

Material and Methods

Economic Integration

Let´s start with a brief explanation of the object – economic integration and economic policy related to these processes. Processes of integration are a fundamental part of globalization. Globalization itself is a very comprehensive process: starting in economy (trade) and transport, accompanied with policy and military, and with consequences for social, cultural and even natural processes. The trigger is in the behavior of companies – from national ones, multinational (or transnational) companies grew up to operate internationally. This is the process of internationalization (Balassa and Wyplosz 1961). Today, internationalization has reached the global scale.

The response to internationalization from the side of governments is an economic integration policy. Countries are creating regional or global integration areas. Regional integration areas are more frequent - the European Union could be an example. The WTO (World Trade Organization) is an example of the latter.

The core of integration processes is the removal of barriers that block a cross-border movement of production factors among countries. Production factors are goods, services, labor force and capital. In addition to these, there are also other factors of production - information or local conditions like climate, raw materials, fertility of soil etc. However, since these factors are immobile or hyper-mobile, they are not greatly taken into account in economic integration. Mobility of the former factors could be seen as flows regulated with barriers of different types: tariffs, quantitative quotas or export/import subsidies (etc.) are prevailing in the case of goods, and different legislative

restrictions in the case of services, labor and capital. Step by step minimizing or total abolishment of these barriers is the purpose of integration and the goal of integrative economic policy.

There are steps in integration: first, removing barriers on movement of goods (industrial) creates a free trade area. In the next step, the integrating countries set a common foreign trade policy together toward so-called third countries. A custom union with apparent economic borders is the result (Doucek 2005). Removing barriers continues inside of such a custom union – labor, capital and services are allowed to move more and more freely. Finally, there are single markets for all the factors in the integration area. According to the level of freedom of the factor movement and also used perspective such an area is called a common, internal or single market (Cecchini 1988). The functioning of integrated areas requires proper economic policy: formulation and implementation is increasingly done in common, eventually by common central authorities. That is why the next steps are economic and political unions.

Integration and System Approach

Integration processes interlink national economies to form larger integration areas. The rules functioning within these areas are reflected in policy-making at different levels - from international, via national, to locals. That is why policy-making in economic integration frameworks is a complicated activity and problems are hard to solve - in fact there is a complex system with a high level of detailed and dynamic complexity (Richardson 2005).

At the same time cognitive limitations, conventionality and the current paradigm of perception of reality – mainly the linearization and tendency to omit feedbacks and delays – still exert a powerful influence on our way of thinking. These influences, that are often referred to as "bounded rationality" (Kahneman 2003) also play a significant role similar to limited information (like its ambiguity, antagonism, lack of clarity), non-linearity that is typical for the economic system, and the defensive behavior of complex social systems. Simultaneously, the general market development reflects the general socio-economic development (Mulej 2006).

Traditional methods (Adda and Cooper 2003), (Pelkmans 1997) and (Mildeová 1994) are not able to help policy makers with the problems described above. Thus the main aim of the paper is to contribute to the development of system thinking in economy and support its practical use and further research.

One of the goals of the paper is to confirm, or refuse, the hypothesis: although the original approach of Senge (Senge 1990) to system archetypes was mainly focused on the environment inside companies, formulas of behavior that have been regularly repeated could be detected also outside - not only inside organizations. We should verify that these repeating structures - system archetypes (generic structures, archetypes of behavior) - make the study of complex social systems easier, and provide a key to the understanding of the structures and limitations in economic integration.

The relation between system thinking and system dynamics will be discussed.

The connecting goal of the paper is to show that system approach support necessitates changes in the thinking and behavior of decision-makers and policy-makers.

It aims to contribute to the development of theoretic knowledge and practical recommendations for the use of systems methods,

and point to new opportunities, especially for decision making support and the improvement of systems thinking in problems related to complex social systems. In our case, we will mainly focus on an area connected to the real-life problems of the economy (and particularly labor forces) from the integration's viewpoint.

The outputs of the paper should be a contribution to a forum in which researchers and policy makers interact to introduce innovations in the field of systems thinking and economy.

Classical and progressive methods for working were applied, such as: induction and deduction, analysis of information, Occam's Razor to the problem definition and definition of its borders, construction of hypotheses, experiment and hypotheses testing, abstraction and modelling, synthesis towards a generalization of results, and contribution to systems theory and economic theory as well.

There is a system thinking paradigm used as a main point of view (Richmond 1993). The present prevailing paradigm of thought is based on the simple causality of observed processes, and with such an approach the recognition of the impact of different policies is very complicated (Richardson 1991). The system thinking that we have been using brings with it a new approach and new tools which can cope better with the complexity (Ragsdell and Wilby 2001). It provides us with a new basic framework for the investigation of these processes (Čančer and Mulej 2008).

The system approach paradigm is based on a principle of relating every cause to its impact and to every other cause with a feed-back loop. This is shifting the approach from a simple (one-way) causality to loop causality, from mutually independent factors to mutually dependent ones without any static weight. We can see the world as a lasting, mutually dependent self -supporting dynamic process. Using a system hierarchy for investigations of economic integration seems to be a promising approach (Němcová and Mildeová 2007).

One important finding of system thinking is that there are many very similar dynamic loops in dynamic systems representing a certain area of human behavior, and certain structures are repeated constantly (Breierova 1997). These repeating structures - system archetypes (generic structures, archetypes of behavior) - were first postulated by Ludwig von Bertalanffy in the 1930s and later were developed and finally labeled as "Archetypes" by Peter Senge (Senge 1990).

At the same time however, we should bear in mind that the system thinking (or systemic thinking) has no unified definition. In general system thinking - dealing with the whole system and thinking about how things interact with one another and systemic thinking Systemic thinking combines analysis (making sense of things by taking them apart) and synthesis (making sense of things by seeing how they fit together for finding the repeating pattern). The term systemics refers to an initiative to study systems from a holistic point of view. Later authors (Mulej and Kajzer 1998, Mulej 2007) leave aside Bertalanffy's intention: systems theory is a worldview of holism and attacks over-specialization (Bertalanffy 1968) and support requisite holism by interdisciplinary creative cooperation or make crucial contributions inside their selected viewpoints alone.

Results and Discussion

Archetypal Behavior in Cases of the Movement of Labor Force

The task of the research project, which this paper is a part of, is to examine the functioning of the internal market among countries of the Visegrad Group after their entry into the European Union (Němcová and Mildeová 2009). The basis of successful internal market functioning is the free movement of four basic factors - goods, services, capital, and labor (although this is frequently referred to as the free movement of persons only). As a simplification, we are going to concentrate on the moving of persons only. The production factor movement is a partially predictable process which repeats certain formulas; therefore, it is legitimate to examine the existence of archetypal behavior in these cases.

Member states of the national labor markets integrated into the EU Internal Market, and step by step an Internal Labor Market has been created. For the EU27 there are important time-lags, the most visible ones being transitional periods for the partial opening used by a few original member states towards new ones. However, there are additional conditions like rules of recognition of qualification etc. The labor force movement has a number of feed-backs – relationship to the source development and target labor markets, changes in unemployment, and the wage development and prices in the short-term. In the long-term there are processes like forming qualification structures of the population, which can limit or support the economic growth of member states or their regions (Mildeová and Němcová 2009).

In addition to that there are other feed-backs within other markets and areas of national economies, like flows of capital in the opposite direction (delocation of jobs) etc. The international movement of labor forces has impacts in the social system of both countries. By "social system" we do not only mean social security systems, but also all the social and demographic structures of both countries which influence the individual behaviour coming out from labor force flows.

Balancing Loop with Delay

Let us take a broad view of labor migration at the EU Internal Market. If we emphasize flows of labor force as one of the relations balancing disparities on mutually linked labor markets of member states, and we take into account time-lags, we can identify the archetype "Balancing Loop with delay" (Figure 1).

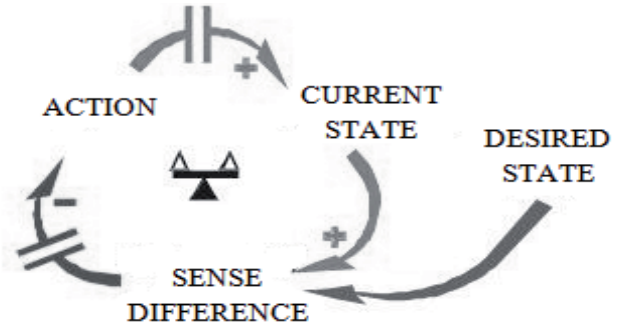

Figure 1: Balancing Loop with delay[1]

1 adapted from http://www.systems-thinking.org/arch/arch.htm

Symbols:

 Balancing loop  delay

"+" and "-" influence notation

This archetype has a negative feed-back which puts the system in equilibrium: labor forces are leaving regions with high unemployment for regions and countries where jobs are readily available. Similarly, labor forces will reflect differences in real wages, both overall and in particular segments of labor markets. "Starting" disparities are results of different factors, and some of them are from outside the labor market and economy. Different time-lags and ways of adjustment can create problems which motivate the countries regulations. The Internal market rules limit the regulations but temporary transitional periods show that postponement leads to a required disequilibrium.

Let us take as an example Poland - a new EU member states with a high emigration. Their transformation process passed in a slightly different way in the comparison with e.g. the Czech Republic. Polish privatization process was accompanied by high unemployment rates. This caused the economic emigration: high numbers of Poles were searching their jobs abroad. In 1990 it was about 18,5 thousands (who newly left the country), in 1995 26 thousands and in 2000 almost 27 thousands. They – contrary to Czechs – hit quotas for the immigration limit into the Western countries all the time. After the entering into the EU, the flow almost doubled: in 2006 it was the same, almost 47 thousands. In the same time we can observe the growth of FDI inflow reflecting EU membership and relatively low wages.

Table 1: Example Poland

Variable	2000	2001	2002	2003	2004	2005	2006	2007	2008
FDI inflow (EUR million)	10,334	6,372	4,371	4,067	10,237	8,330	15,741	16,674	10,970
Unemployment rate (%)	15.1	17.5	20.0	20.0	19.0	17.6	14.8	11.2	9.5

Source: PAliZ, http://www.paiz.gov.pl/poland_in_figures 20.10.2009

The decline of unemployment rates, the rise of vacant job numbers and the slight growth of labor costs followed by the time-lag. FIrstly in 2007 after the entering the EU, the number of Poles leaving country for jobs dropped to 35 thousands[2]. Note please that economic crisis hit the West European countries in 2008 and the decline of vacant job numbers has been observed since the second half of 2008. So we can say that after years of economic emigration the opposite flow of FDIs had started to change the behavior of Poles and cut the number of emigrants. The country started to seek a new balance. The very same historical picture was observed in Ireland when the break of the trend came in early 90s. Unfortunately statistical data of 2008 and 2009 are affected by economic crisis.

When working with behavior of this archetype it is important to clarify what is the required state of the system and if it is reachable under current conditions. If not, it is necessary to change the conditions or the definition of the desirable state. It is also important to find out if the required state could be reached from both sides or from one side only (dependencies). There is a danger of "over- shooting". In some cases we cannot get over certain states (values). This leads to another archetype – "Indecision" (Vojtko and Mildeová 2006).

This archetype is created by two cycles with negative feed-backs. Both relations tend towards to one state (value) but there are different time-lags. This causes the oscillation. The specific state of this behavior is called dynamic equilibrium. The occurrence of this special state of goal oriented behavior is

2 Rocznik demograficzny 2008, Glowny urzed statystyczny, Warszawa, http://www.stat.gov.pl/gus/5840_3697_ENG_HTML.htm?action=show_archive

frequent in economics. The functioning of labor markets is more complicated since there are more than two loops.

Another good example of Balancing Loop with delay could be a negotiation process on subsidies to pro-environmental projects. The important feature is an asymmetry of information in the sense that only applicants, who are mostly also authors of the projects, know more realistic data on their costs as well as the moment of reaching equilibrium and conditions of such a situation. (Šauer, Dvořák, Lisa and Fiala 2003). This example could be generalized for any number of projects in general if they are co-financed from different funds - private, local, national or from the EU budget under the EU schemes and rules.

Shifting the Burden

Taking into account political and legislative reaction towards the international movement of labor forces we can recognize the archetype "Shifting the burden" (Figure 2).

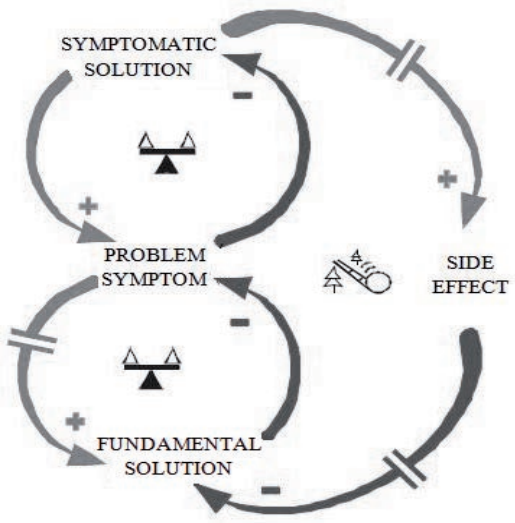

Figure 2: Shifting the burden[3]

In this situation, instead of solving causes of the problem like insufficient support of employment or an inadequate income policy - see the case of Czech and Slovak health care systems (Stričík 2003) - only the symptoms are cured. The real solution has been moved into the future. In the short-term horizon a symptomatic solution can have good effects (Ukrainian personnel), but the situation can suddenly deteriorate, since the cause remained unsolved and this can negatively influence the equilibrium of the system.

3 adapted from http://www.systems-thinking.org/arch/arch.htm

Reinforcing loop

Let us have an example linked with already mentioned problems regarding the Czech health system financing due to the migration processes. We focused on the high qualified labor migration –doctors and their staff. Although the number of newly graduated doctors is appropriate regarding the Czech health system needs, the higher and higher numbers of young doctors are moving westward (Germany, UK, Ireland) to get better salaries and perspectives in their careers (Vavrečková 2009). Following data are describing growing problems: an average age of practitioners was almost 53 years old and the share of practicing doctors over 65 years old was 25% in 20054. For 2015 they estimate that 65 years old practitioners exceed 50%. The setback of this situation is evident. Younger generation moves out of the country and the inflow of doctors from abroad (Slovakia, Ukraine etc.) is not sufficient just for a simple reproduction. Already at the end of 90´s it was evident that Czech salaries of doctors were not competitive due to the free labor moving. After entering the Czech Republic into the EU the migration potential was growing but the shifting of the burden has been making the situation worse and worse.

Such behavior is common among politicians. They know sometimes that they are addressing only symptoms, but addressing the cause would be political suicide for them. So, they postpone it for future governments.

Other Archetypes

We can also identify an additional number of other archetypal behaviors (Bellinger 2009) among the participants and policy makers of different levels in the field of the free movement of labor forces. Definitively we can find archetypes like:

4 UZIS, http://www.praktikcz.eu/vekova_struktura.html

Escalation is an archetype describing the growing spiral of the competition lead with the fear of the loosing oneself position and the fear of competitors being better. Such a behavior is typical for the decrease in cost, production cost and also production price decrease. There is a specific example which we can observe: situations when immigrants take less qualified jobs and they are usually ready to sacrifice their qualification and also accept lower wages in comparison with the local domestic labor force. The protection of the domestic labor force is required and could be a response - the protection of present level of incomes. Wages in general tend to be non–elastic downturn. In this point the archetype seems not to be fully followed and this is valid for nominal wages. Incoming cheaper labor force usually slows down the nominal wage growth or even stops it. On the contrary real wages can especially decline in a long run. This confirms the archetype validity in these cases.

Fixes that Fail – Illegal immigration causes problems not only at a labor market but it is usually associated with the shadow economy and even organized crime. Any oppressive measure aims to limit or even stop this illegal immigration usually leads to growth of costs of illegal immigration. And relation with an organized crime will be stronger.

Eroding Goals - The observation of the behavior following this archetype is generally very frequent in economic policy. The political opposition usually proclaims very strong goals. If politicians from opposition manage to win elections and start to rule, their goals are usually eroded or even forgotten. This is also valid for any policy towards free production factor moving including labor force. Our comment to this behavior asks the careful goal evaluation in time and the requirement or pregnant and realistic set of goals for the governing period. Goals from

opposition time could lead to extremism but the public who elect the new government should insist on following latter ones.

Accidental Adversaries - Many incoming workers use an assistance of other people coming from their home country, speaking their language. On the labor market of the target country these partners compete with their employers. Similar archetype can be observed also in a case when highly qualified workers come to get a job as employees. This is the cooperative part of the archetype. But after a certain time and under certain circumstances they can set up their own company which will be a competitor to their former employers.

Tragedy of the Commons describes a situation when a source is commonly used and it is not renewed. Such a situation can be observed in case of the brain drain in the source country: the most qualified labor force is leaving the country and the gain of its performance will be acquired by the target economy. This contribution to the growth is missing in the source economy and influence conditions of education of the next generations for both the countries.

But similar situations can follow after decision of not sufficient investments into education in general. These insufficient investments are going to be a limit to economic growth. The typical situation is with the erosion of the technical education in the EU. We can describe it as an archetype **Growth and Underinvestment**.

The solution of such a situation can be already mentioned as a brain drain following archetypes called **Success to the Successful**.

Limits to growth archetype might be observed also in cases of the brain drain. The recent experience with the migration of IT persons into original EU15 countries from new member states (and third countries, too). IT specialists were attracted by higher wages but these incomes were stopped in relation to the meeting of supply and demand on this specific segment of the labor market. The decline of real wages which came after, led them to return this labor force back to home country. We can observe this archetype in general in cases of territorial enlargement of regional integration areas.

Furthermore, there are many ways in which the archetypes can interact with each other (Braun 2009).

Next Research

System thinking has many connections to various schools of thought. At the same time it is necessary to say that the schools of thought and the main ideas of these schools which influenced the systems approach were developed in relative isolation and used different arguments (Umpleby and Dent 1999). We are among the supporters of the process whereby many system thinking protagonists in the nineties developed bridges between two strands of systems theory: system thinking and system dynamics towards a multimethodology concept (Ossimitz 1996) and (Mingers 1997).

To understand the definition of system dynamics and systems thinking you can use the official website of The System Dynamics Society, as an international organization devoted to encouraging the development and use of system dynamics around the world. This site defines system dynamics as follows: [5]

"System dynamics is a methodology for studying and managing complex feedback systems, such as one finds in

5 http://www.albany.edu/cpr/sds/

business and other social systems. In fact, it has been used to address practically every sort of feedback system. While the word system has been applied to all sorts of situations, feedback is the differentiating descriptor here".

And the relationship of systems thinking to system dynamics is defined as follows:

"System thinking looks at exactly the same kind of systems from the same perspective. It constructs the same causal loop diagrams, but it rarely takes the additional steps of constructing and testing a computer simulation model, and testing alternative policies in the model".

For more details see (Forrester 1961) and (Sterman 2000).

Our next research should be aimed at these additional steps of constructing a system dynamics model, and testing various policies with the model according to (Yamaguchi 1997), (Schwaninger and Groesser 2008) and (Mildeová 2005). We suppose that the understanding of the archetypes together with the application of system dynamics principles could provide the decision makers with a powerful tool for integration policy. It also could help to "widen the horizons" for possible variants of solutions and to point out the key areas of decision-making, while keeping a global view on the strategy process. It also probably contributes to getting over mental barriers and to stimulating the system thinking of a politician.

Conclusions

In the introduction of this paper we formulated a hypothesis - although the original (and traditional) approach to system archetypes has been primary focused on companies, archetypal behavior could be detected also in economic integration – which was confirmed.

Production factor movements on the EU Internal Market are intermediated with market mechanisms and could be limited with a particularly focused state regulation at all levels - starting with the local government, via member state government and finishing at an international (community) level. Feedback reflects these measures that the factors' movement begins in the very complicated social economic system of a country.

The cases demonstrated in this article can help us to understand the context of economic integration processes, and support our system thinking. System archetypes allow the transferral of the complexity of economic integration processes into simpler schemes that help us find the correct solution for a present situation. The schemes can show principles of adverse situations in cooperation and demonstrate the symptoms of problems. The number of archetypes can negatively influence economic integration development, especially if the core problems of their manifestation are not correctly interpreted. The proper use of system archetypes is the first step towards the practice of system perspectives, but no way the only one possible.

We do not take system archetypes as an unchangeable truth, and we do not mechanically find examples of such a truth in the development and performance of integration. Use of the system archetypes described in this article is to change the process of our perceptions. It can also work towards a learning process

based on adaptation to changes in our environment - when we are using feedback to change our own mental models of the surrounding world.

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