NEW ECONOMY IN THE CZECH REPUBLIC AND GERMANY: COMPARISON

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Abstract

The first paper section formulates the relationship of two categories - new and knowledge economy. Then the paper provides an overview of European and American systems which characterizes the quantitative aspects of new economy. Emphasis is placed on the American system. Research realised at the Faculty of Business Administration of the University of Economics has used the basic principles of American methodology for its own specific assessment system for the evaluation of the new economy quantitative aspects in the European Union. The research results for the Czech Republic and Germany are included in the last part of the paper.

Key Words: new economy, knowledge economy, European Union

JEL codes: O520 - Economywide Country Studies: Europe, O100 - Economic Development: General

Introduction: Knowledge and New Economy

When analysing the knowledge economy and the new economy as two different terms, it is clear that they both observe similar processes that run on the level of the world economy but also on the level of the national economies. However, their approaches differ. The main common feature is emphasis on education, knowledge and ICT in the globalised economy. Nevertheless, certain differences can be found.

Important technological changes (so-called positive supply shocks) happen approximately two or three times in a century. Time between each change can be considered as a relatively persistent period. Such changes have deep impact on the economy. The 90's of the 19th century are characterised by fast manufacturing industry development. Other important positive supply shock takes place in the 40's and 50's of the 20th century and is connected with mass production and development of transnational companies. ICT development is at the core of the following important positive supply shock. It comes to light during the 90's of the 20th century and lasts till today. This is the reason why the knowledge economy can also be identified as a term summarising today's important positive supply shock.

The new economy was made up as a term going hand in hand with the concrete development of American economy in the 90's of the 20th century. The emphasis is on structural change in economy and macroeconomic development (especially in the USA, where the effects of the knowledge economy arose first). The new economy can be, therefore, seen as a particular historical period of economy development, as a period of economic growth, when the knowledge economy took positive effect.

Other authors [for example, Information Technology and Innovation Foundation (2008), p. 3] match new economy with the set of qualitative and quantitative changes which has changed the structure and functioning of all economies during last two decades. New economy is connected with globalization, entrepreneurship activity and knowledge. In this sense, new economy and knowledge economy in fact have merged.

In the following text, we will analyse the current state of new (knowledge) economy in the Czech Republic and in Germany, with the stress on its quantitative aspect. From this point of view, we can practically regard new and knowledge economy as synonyms.

1. Quantitative Aspects of the New Economy

Bearing this in mind, research and statistical institutes model systems of indicators. The main purpose of the systems is to find adequate quantitative characteristics for the new economy. The first one is an American system originally created by the Progressive Policy Institute. The other one represents results of a European project called NESIS (New economy statistical information system) which is an output of the FP5 (The fifth EU framework programme for research and technological development). In the text, we will concentrate on the American system "State New Economy Index".

The State New Economy Index is a system for classification of the new economy in member states of the USA presented first by the Progressive Policy Institute in 1999 and then in 2002. Jílek explained the one of 1999 to Czech readers in 2000. The Information Technology and Innovation Foundation (ITIF) has followed the activity of Progressive Policy Institute and published similar State New Economy Index in years 2007 and 2008.

The Progressive Policy Institute and The Information Technology and Innovation Foundation State New Economy Indices have applied a little bit different sets of indicators. It is reason why they are not fully comparable. We will apply the Information Technology and Innovation Foundation (ITIF) methodology from the State New Economy Index 2008 (published in 2010) in the following text.

The overall new economy score for every U.S. member state is derived from weighted and normalised values of partial indicators. The calculation of concrete partial indicators values is computed on base of the ordering all fifty states.

The value of the total score and ranking for particular states of the USA consists of weighted and standard values of the partial indicators. The new economy index of 2008 is composed of 29 partial indicators.

The partial indicators are divided into five modules. Main purpose of the groups is to outline the key characteristics of the new economy.

Simple and easily repeatable procedures were at the core of the production throughout the major part of the 20th century. Manual skills and in some cases also strength were required for such a kind of an activity. On the other hand, the new economy is typical for raising role of creative work. This, however, demands good quality education and creative approach, which is the incentive to enlist the "knowledge jobs" module to measure the particular states' workforce education.

Speaking of the 40's of the 20th century, the economy (at least the one of the big countries) was built on activities of companies on the national markets. Successful companies were doing business on the national market. On the other hand, less successful companies operated on local or regional markets. Considering the new economy, successful companies occupy primarily the world market. These are the reasons for the next module "Globalization" measures the particular states' involvement in the world economy.

Big corporations were typical representatives of the "traditional" economy. They had to face only limited competition on stable national market. However, the new economy is highly dynamic and competitive. The ability to adapt, evolve and cope with competition is according to ITIF the one key factor for good performance of the Union member states. The indicators measuring dynamics and competitiveness are assembled in the third module "Economic dynamism".

Contemporary revolution in ICT began in the mid-1990s. Till the beginning of the early 90's most economic transactions required the merchandise to be physically transferred. Furthermore, all the documents were only in hard copy. All the negotiations were held in person or via landline. On the contrary, in the new (digital) economy most of the transactions happen electronically. As the matter of fact, ICT penetrated into every branch of the economy. Labour productivity in the new economy is influenced by the ICT technologies as much as it was influenced by electricity-using technologies in the first two thirds of the 20th century. The category "Digital Economy" is a group of indicators focusing on ICT.

In the past, economic growth was mostly achieved by raising capital, labour and natural resources volumes. On the other hand, it is knowledge and innovation that form most of economic growth in the new economy. Furthermore, innovation of technology is at the core of economic growth. Not only knowledge and innovation but also implementation of the new findings is measured by the fifth group of indicators (module) called "Innovation capacity".

2. Methodology

The methodology how to evaluate the quantitative aspects of new economy which was used by the ITIF for the U.S. member states the researchers from the Faculty of Business Administration of University of Economics, Prague have applied for 27 countries of the European Union. It was realised in the frame of research project "The new theory of economy and management organisations and their adaptation".

The methodology used at the Faculty of Business Administration was inspired by the ITIF practice but it is not identical. It is given mainly by the availability of the statistical data for all EU member countries. Methodology requires the calculation of the average value for each indicator and so there was necessary to know all data for each of 27 member state.

The indicators´ structure which was used for new economy evaluation in the Faculty of Business Administration project is visible in the table No. 1. Together 16 indicators were used for the evaluation of new economy quantitative aspects. Data were extracted from Eurostat and the year 2007 was used.

The score for each indicator is given from the raw data on the base of the following formula:

$$Hij = (Xij - Xj) / Sij$$

Where Hij is the i country score in the partial characteristics j, xij is a raw value of the i country score in the partial characteristics j, xj is average value of j characteristic for the EU as a whole and Sij is a standard deviation of characteristics j.

Raw scores are based on standard deviation from the mean. Therefore, on average for the most indicators, approximately half the states initially have negative score (below the EU mean) and approximately half have positive scores (above the EU mean). The scores are equally adjusted – ten is added to each indicator to ensure that all are positive.

In the next step, the five modules totals were calculated. In this calculation the indicators were weighted. The reason was the same as in the ITIF methodology: to restrict the impact of

closely correlated indicators (for example, number of patents applications and number patents of granted) do not bias the total results.

The Faculty of Business Administration project has applied the same number of modules as the American one. Also the each module weight is the same in both projects. We regard the percentage weight of each module and not in the raw score. The table No. 2 contents information about the weight of each module.

The overall new economy score for the Czech Republic and Germany is given by the algebraic sum of the five modules totals. The table No. 1 also contents these overall new economy scores.

3. New Economy in the European Union

The overall new economy score (based on 16 partial characteristics) for all 27 EU member countries and for the year 2007 indicates the figure 1.

European countries are divided into four groups. Their division is based on their overall new economy score and the following methodology. The range between the highest and lowest score was calculated and divided by four. That product was subtracted from the top score to calculate the range for the 100th to 76th percentile and likewise for the other three percentile ranges.

The used methodology result is the percentiles do not necessarily divide into an equal number of states, but rather indicate which country scores fall into a particular range.

The used methodology indicates the new economy advantages are exploited mainly by Germany and its near neighbours (i.e. Netherlands, Luxembourg and Austria) and followed by the Scandinavian countries (Sweden, Denmark and Finland).

Germany has got the highest overall new economy score, followed by Sweden. German economy disposes important technology innovation capacity. It belongs to the European top in the private (company) research and development expenditures and also in share of the high-tech jobs in the total employment. In addition, the German economic agents are able to transform these possibilities into the technology development real results. For example, Germany has got the second higher number of European patent application (after Sweden) but it is the number one in the number of granted patents.

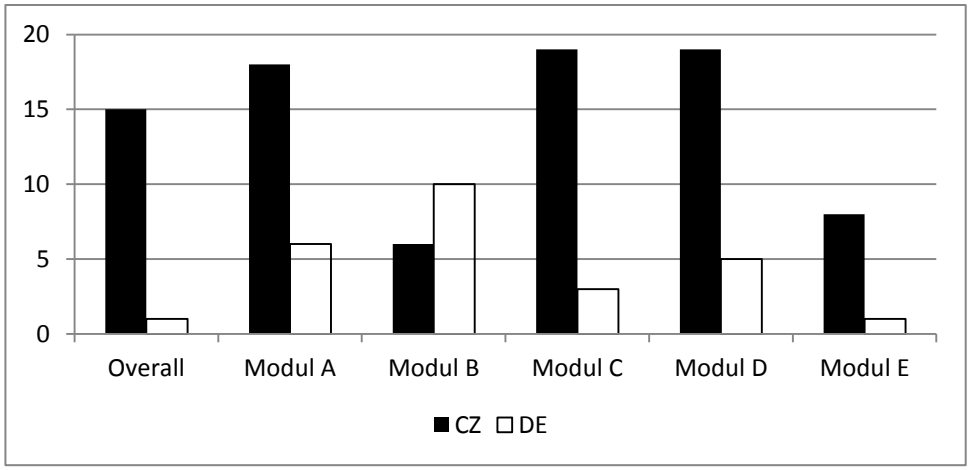
Fig. 1: The overall new economy score in the EU countries in 2007

Source: own computation, on the base of Table No. 1 data

4. New economy in the Czech Republic and Germany

The development of new economy in the Czech Republic and Germany illustrates both following figures 2 and 3. Figure 2 compares the Czech Republic and Germany from the modules point of view. The figure 3 illustrates the new economy in more detailed picture; it shows the situation of both countries in all 16 individual characteristics.

Fig. 2: Modules results

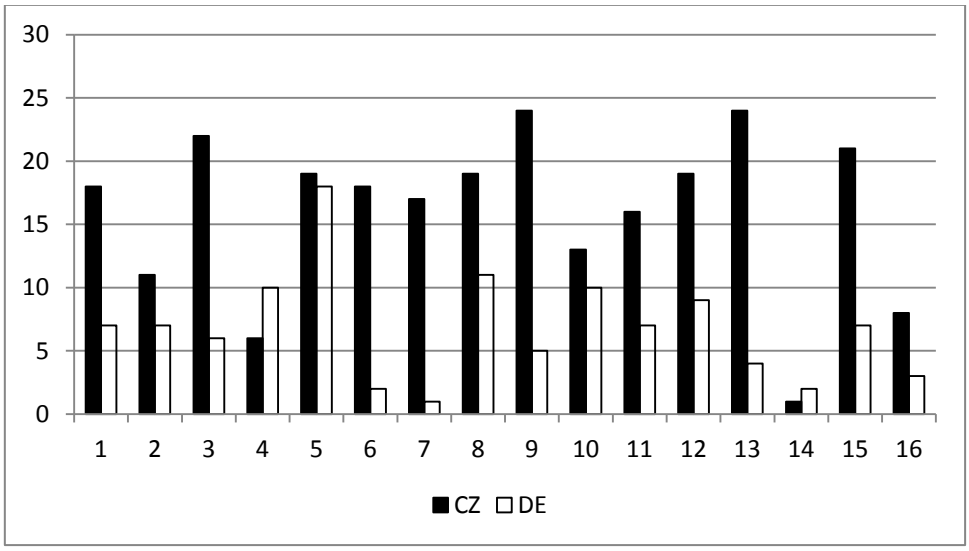


Source: own computation, on the base of Table No. 1 data

If we compare Czech Republic and Germany, Germany has got better results in all new economy indicators. There are only two exceptions: the Czech economy openness (measured by the foreign trade turnover) is higher and also employment in high - and medium-high-technology manufacturing sectors is slightly higher in comparison with this form of employment in Germany.

Firstly, we concern the economy openness. The Czech economy is much smaller then German one and it is much more connected with European market. The key role in the Czech imports and exports plays Germany. Czech economy and German economies closely co-operate. It leads to bigger openness of the Czech economy and better ranking in the module "Globalization" indicators.

Fig. 3: Individual characteristics results



Source: own computation, on the base of Table No. 1 data

Secondly, we regard employment in high - and medium-high-technology manufacturing sectors. This employment is almost the same in both countries. It is given by traditional role of manufacturing sector in the Czech Republic and in Germany. Now it is closely connected with current cooperation among Czech and German firms. Czech firms serve mainly as a subcontractors for Western Europe (and mainly German) companies.

This analysis shows the Czech Republic is falling behind Germany in most quantitative new economy characteristics. Nevertheless, when taking into account the current phase of economic cycle (recession and recovery) this gap paradoxically proves a good sign. The Czech Republic's being relatively behind indicates the new economy growth potential. The features that form the new economy present resources that can help the Czech Republic to cope with the current economic recession and coming recovery.

Tab. 1 – Indicators´shares

Item	Czech Republic		Germany		Best country	
	Score	Rank	Score	Rank	Country	Score
Overall	**113,61**	**15**	127,03	**1**	**Germany**	**127,03**
Human resources in science and technology	9,57	18	10,59	7	Netherlands	11,43
Workforce education	10,46	11	10,55	7	Estonia	11,17
Non-nationals in the labour force	9,02	22	10,38	6	Estonia	13,50
Module A	**29,05**	**18**	**31,52**	**6**	**Estonia**	**35,37**
High tech trade turnover	10,41	6	10,12	10	Malta	12,68
Foreign direct investment intensity	10,00	19	10,00	18	Luxembourg	15,32
Module B	**10,31**	**6**	**10,09**	**10**	**Luxembourg**	**13,33**
Total European patent applications	8,99	18	11,00	2	Sweden	11,83
Patents granted by the USPTO	8,88	17	12,22	1	Germany	12,22
Share of renewable energy	9,29	19	9,95	11	Austria	12,95
Module C	**20,35**	**19**	**25,56**	**3**	**Sweden**	**26,57**
Online households	8,88	24	11,00	5	Netherlands	11,70
Online enterprises	10,29	13	10,29	10	Netherlands	10,86
E-government	9,82	16	10,67	7	Austria	11,84
Braodband access	9,27	19	10,35	9	Denmark	12,30
Health IT	8,91	24	11,42	4	Luxembourg	12,04
Module D	**23,59**	**19**	**26,86**	**5**	**Netherlands**	**28,17**
High-tech jobs	11,55	1	11,50	2	Czech republic	11,55
Scientists and engineers	8,85	21	10,58	7	Belgium	11,92
Business expenditure on R&D	9,92	8	10,92	3	Luxembourg	11,48
Module E	**30,31**	**8**	**33,00**	**1**	**Germany**	**33,00**

Source: own computation, on the base of statistical data published by Eurostat

Tab. 2 – Modules´ Shares

Module shares	ITIF	%	FPH	%
A	5	24,10	2,5	22,22
B	2	9,64	1,00	8,89
C	4,5	21,69	2,25	20,00
D	4,25	20,48	2,5	22,22
E	5	24,10	3	26,67
Total	20,75	100,00	11,25	100,00

Source: own computation, on the base of [Information Technology and Innovation Foundation (2010), s. 70] data

Conclusions

The knowledge economy is identified as a term summarising today's important positive supply shock in this paper. The new economy can be seen as a particular historical period of economy development, as a period of economic growth, when the knowledge economy took positive effect. Other authors match new economy with the set of qualitative and quantitative changes which has changed the structure and functioning of all economies during last two decades. New economy is connected with globalization, entrepreneurship activity and knowledge. In this sense, new economy and knowledge economy in fact have merged.

In the following text, we will analyse the current state of new (knowledge) economy in the Czech Republic and in Germany, with the stress on its quantitative aspect. From this point of view, we can practically regard new and knowledge economy as synonyms.

The methodology used in the paper was inspired by the ITIF practice but it is not identical. It is given mainly by the availability of the statistical data for all EU member countries. Together 16 indicators were used for the evaluation of new economy quantitative aspects divided into 5 modules (groups).

The used methodology indicates the new economy advantages are exploited mainly by Germany and its near neighbours (i.e. Netherlands, Luxembourg and Austria) and followed by the Scandinavian countries (Sweden, Denmark and Finland). These countries (and mainly Germany) dispose important technology innovation capacity. . In addition, these economies are able to transform their possibilities into the technology development real results.

The Czech Republic is in the 15 th among all 27 EU member states. Nevertheless, when taking into account the current phase of economic cycle (recession and recovery) this gap paradoxically proves a good sign. The Czech Republic's being relatively behind indicates it

has got in the new economy growth potential. The features that the new economy present resources that can help the Czech Republic to cope with the current economic recession and coming recovery.

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