

# DYNAMIC EQUILIBRIUM OF THE GLOBAL ECONOMY – EFFECTS OF CYCLIC DEVELOPMENT

Jiří Kraft<sup>1</sup>, Ivana Kraftová<sup>2</sup>

<sup>1</sup>Technical University in Liberec, Czech Republic, Jiri.Kraft@tul.cz

<sup>2</sup>University of Pardubice, Czech Republic, Ivana.Kraftova@upce.cz

## Abstract

The aim of this paper is to picture the global economic performance and economic performance of the selected national economies (USA, Chad, Japan, BRIC countries – Brazil, Russia, India, China-, Europe – the Czech Republic, Lithuania and Latvia) and validity checking of Juglar cycles for the period from 1970 until now.

At the same time, the attention is focused on the assessment of innovative investment character in cyclic development. On the one hand, it is based on evaluation of the investment effectiveness and changes in total value added in the sector structure which are associated with technological advances. On the other hand, it emphasizes services aimed at improving human welfare.

It is possible to confirm temporality of Juglar business cycles by the measurement of GDP. Their causes and consequences are influenced by subjective anomalies which react against objective development processes, both quantity and quality of the used technological progress and socioeconomic changes for example in Europe after 1990.

*Keywords:* Juglar cycle, investment effectiveness, total value added, changes in branch structure.

## Introduction

The economic growth (respectively socioeconomic development) has been achieved on the base of dynamic equilibrium. The achievement of such a balance is not trivial. On the contrary, the reality displays that the rule is a cyclic distortion which causes and stimulations are factually different but they always are an expression of inadequate economic behaviour.

The aim of this paper is to picture the global economic performance and economic performance of the selected national economies (USA, Chad, Japan, BRIC countries – Brazil, Russia, India, China-, Europe – the Czech Republic, Lithuania and Latvia) and validity checking of Juglar cycles for the period from 1970 until now.

At the same time, the attention is focused on the assessment of innovative investment character in cyclic development. On the one hand, it is based on evaluation of the investment effectiveness and changes in total value added in the sector structure which are associated with technological advances permitting quantitative (territorial, commodity) and qualitative (effectiveness link) growth markets in a globalized world. On the other hand, it emphasizes services aimed at improving human welfare.

The cause and the platform of globalization is the technological progress but not „general“. Creation and development of technologies enables quantitative (territorial, commodity) and qualitative (integration efficiency) markets' growth. Especially, it is a technological progress in Transportation sector, Informatics and Telecommunication (further just „TIT“) (Kraft & Kraftová, 2009). Particularly these three sectors represent the dominant platform for the development of exchange of material and non-material values, markets' development and above all mobility of production factors aimed to maximizing economic efficiency of their integration. The modern technology TIT can be marked as a technological base of concept and development of interdependent global economy.

The base of the approach is to process available statistical data (time series analysis from year 1970 to 2008; in some cases with regard to socio-political reality, only 1990-2008) and assessment of outputs derived from the perspective of macroeconomic theory with emphasis on the intersectoral comparison using sector analysis.

## Development of economic performance in economic globalization and its 5 supraregions

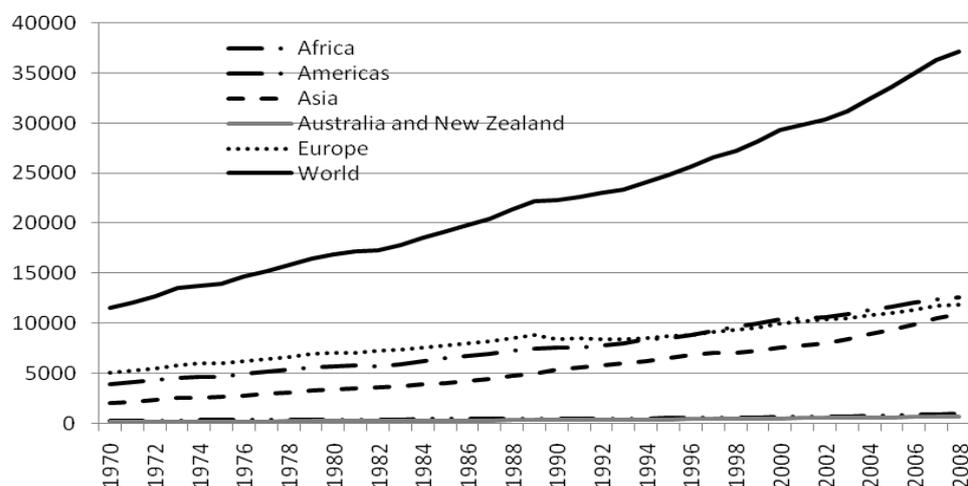
The economic performance has a cyclic development, (Kraft & Bednářová 2006), which is caused by a number of economic and non-economic causes. C. Juglar defined its duration between 9 and 10 years at the turn of the 19<sup>th</sup> and 20<sup>th</sup> century. The question is if the duration does not change in dynamic development of the world and if the cycle is in the globalized economy synchronic or not. Globalization has been associated with the turn of the millennium but the basis of the globalization was already created by processes in the 19<sup>th</sup>

century which had the form of monopolization economies; since the mid-20<sup>th</sup> century it was economic integration. The phenomenon of globalization has its origin at the national level. (Kraft & Kraftová, 2007)

Globalization today has been defined as the "power of financial markets". It has been associated with dominant tertiary sector, including the TIT and a relatively high level of labour mobility, with the exception of Europe. In this context, it is also more likely to say that globalization is the impulse of technological progress, since it finds its application there. At the end of the 20<sup>th</sup> century, economic globalization gets a new face. Economic globalization is perceived as far more significant factor affecting both, the macroeconomic sphere, and economic microspheres. Within the global economic system, there is a discrepancy between the reality of sovereign countries with their own economic policies and global regime of economic and financial matters.

In terms of the relationships and mechanisms of the world economy there was uneven development of economic levels in different countries and regions. Principles of market mechanism have a positive impact on efficiency, but they are not able to prevent accumulation of advantages to benefit stronger business entities and disadvantages to weaker entities. (Kraft & Fárek, 2008) On the other hand, globalization creates a new potential. It enables to mitigate adverse impacts and enhance adjustment processes but at the same time it also contains the threat of enhanced transmission of economic crisis.

Global economic performance grew dynamically in the period between 1970 and 2008. It is illustrated by the Figure 1. GDP in 2008 stood at more than triple in 1970.



**Figure 1.** GDP Development – World and selected regions (at constant 1990 prices in US Dollars)

Source: own elaboration based on data processing [cit. 31.12.2009] Available from: World Wide Web: <http://unstats.un.org/unsd/snaama/dnlList.asp>

It is impossible to omit that the performance imbalance still persists in individual regions. It is evidenced by data on their share of the world economy in 2008, listed in Table 1. The development of growth dynamics measured by GDP in individual regions is also interesting, above all Asian economies (especially after the year 2000) but also African economies even though their growth dynamics with regard to the share of global GDP influences world economy only slightly.

**Table 1.** Region growth performance in the world and their share of global GDP

Region	Growth index 2008/1970	World GDP share in 2008 v %
Africa	3,67	2,7
Americas	3,20	34,0
Asia	5,29	29,5
Australia and New Zealand	3,16	1,7
Europe	2,36	32,1
World	3,22	100,0

Source: own elaboration based on data processing [cit. 31.12.2009] Available from: World Wide Web: <http://unstats.un.org/unsd/snaama/dnlList.asp>

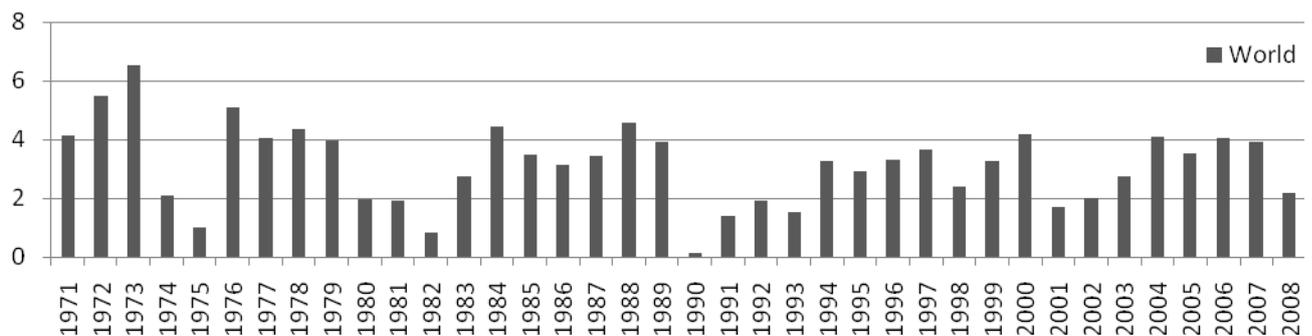
If we focus on the incremental value of world GDP of the 5 examined regions, it is possible to see that in the period were essentially 4 cycles (the first one was between the years 1991 and 2001 and lasted 7 years; the second one was between the years 1982 and 1991 – 9 year cycle; the third one between the years 1991 and 2001- 10 year cycle; the fourth one between the years 2001 and 2008 – 7 year cycle). The average length of the cycle in more than 30-year period is 8.25 years. Relative decline in GDP gains of individual regions reflect almost in the same years within the cyclic development as shown in Table 2. Figure 2 shows development of gains in global GDP.

**Table 2.** Years of the cyclical downturns in the period between the years 1970-2008

World	1975		1982		1990	1998	2001	2008
Americas	1975	<i>1980</i>	1982		1991		2001	2008
Asia	1974	<i>1980</i>	1982		1993	1998	2001	2008
Australia and New Zealand	1977		1982		1990-91		2000	2008
Europe	1975		1981		1990-93	<i>1996</i>	2002	2008
Africa	1975		1981-83	1986-87	1992	1999	2002	

*Note: Italics illustrates the years in which occurred decreases partly.*

Source: own elaboration based on data processing [cit. 31.12.2009] Available from: World Wide Web: <http://unstats.un.org/unsd/snaama/dnlList.asp>



**Figure 2.** Development of global GDP growth (at constant 1990 prices in %)

Source: own elaboration based on data processing [cit. 31.12.2009] Available from: World Wide Web: <http://unstats.un.org/unsd/snaama/dnlList.asp>

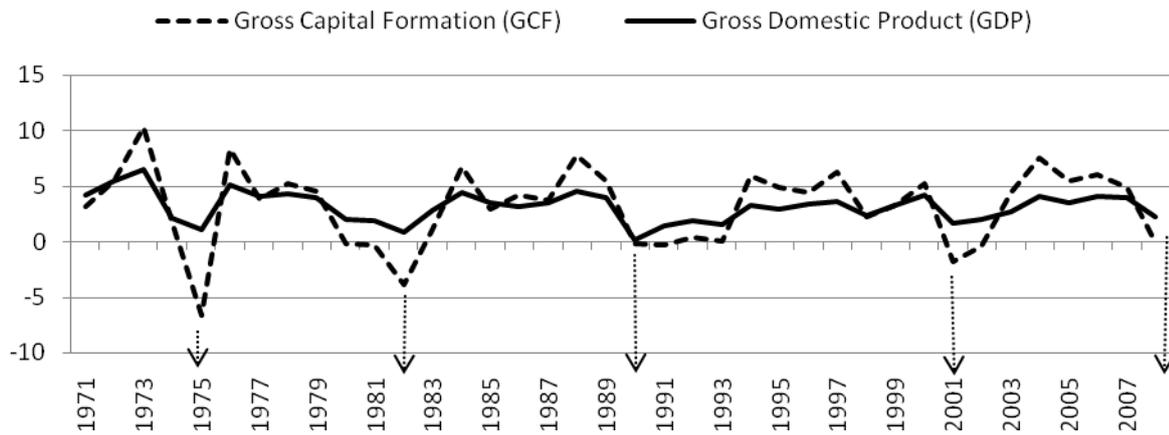
Statistics above confirms that the whole economy and its particular regions retain their cyclical character due to its market structure. Descending part of the economic cycle (recession) is a recovery phase which eliminates excesses of past developments. It is possible to say that it retains so-called medium-term Juglar cycles.

The question remains whether the major cause of these cycles is still necessarily machinery and equipment investment (according to Juglar also their credit cover) or whether it is a modification of these causes. Contemporary crisis was provoked by chain reaction missteps in the U.S. economy or the crisis related to ecological, energy and raw material issues.

High degree of business cycle synchronization of the various regions in the world economy is closely linked to its globalization. The fact that the synchronization was already reality in the past, it can be understood as evidence that globalization has its origins in the distant history.

### The effectiveness of investment in selected national economies

An important descriptor of cyclic development are investment trends (measured by gross capital formation – further just GCF) compared to GDP development. This trend and relations of both indicators confirm cyclical downturns as defined above (see Figure 3).



**Figure 3.** Comparison of GDP and GCF development in the global economy  
 Source: own elaboration based on data processing [cit. 31.12.2009] Available from: World Wide Web:  
<http://unstats.un.org/unsd/snaama/dnlList.asp>

In addition, it is important to consider indicator of investment effectiveness (GDP divided by GCF). Development of investment effectiveness was evaluated in the global economy as a whole and in the particular national economies: USA - the richest country of the world; Chad - the poorest country of the world; Japan and Europe – complete the triad leader of the world, BRIC countries (Brazil, Russia, India, China) as a potential group of countries called “tigers”; the Czech Republic, Lithuania and Latvia as an example of the former socialist countries which joined the EU in 2004. There was observed the period between the years 1970-2008, in the economies in the former socialist bloc with regard to socio-political reality and lack of data only the period from 1990 to 2008).

**Table 3.** Indexes of investment effectiveness development (GDP/GCF) of the global economy and selected regions

region	Growth index		region	Growth index	
	2008/1970	2008/1990		2008/1970	2008/1990
world	1,00	0,95	Lithuania	.	0,75
USA	0,84	0,90	Latvia	.	0,87
Chad	0,32	0,48	Brazil	1,22	0,88
Japan	1,53	1,46	Russia	.	2,12
Europe	1,20	1,01	India	0,55	0,68
CR	.	0,84	China	0,87	0,86

Source: own elaboration based on data processing [cit. 31.12.2009] Available from: World Wide Web:  
<http://unstats.un.org/unsd/snaama/dnlList.asp>

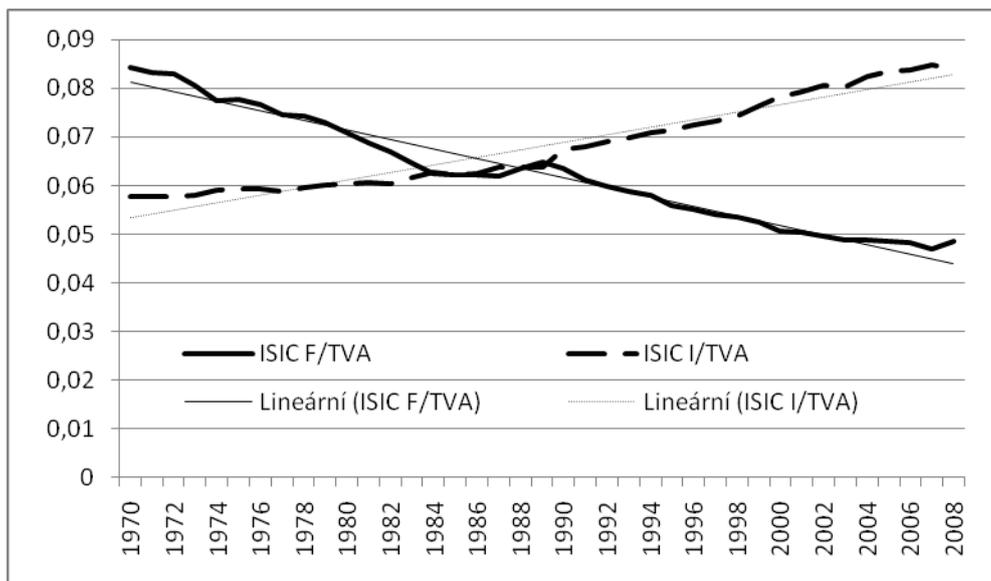
Table 3 shows different development in longer interval (index 2008/1970) and in shorter interval 2008/1990). Only Japan and Europe has their value higher than 1 even though efficiency of investment has been relatively declining. On the contrary, the situation of the USA has been relatively better in shorter interval (it is the opposite trend in the 3 traditional centres of world economy) as well as in Chad and India. However, it is necessary to analyze sector structure development of economies to be able to evaluate causes of this condition. ISIC Rev. 3.1 is applied in the sector analysis, valid until 2008 inclusive, but its division is a little bit outdated. ISIC Rev. 4 valid since 2008 has much more appropriate structure. On the one hand, the attention was focused on TIT (incorporated more or less in the section ISIC) and building industry (ISIC F). On the other hand, it compared development of services aimed at improving human welfare (ISIC J to P) against dominant economic structure – industry (ISIC D). In the structure analysis, Total Value Added (TVA) is used as performance efficiency indicator with regard to the construction of indicators and not GDP.

### Sector influence – representatives of hard and soft investments on economic effectiveness

If we start from the default connection of Juglar cycles and investment, then the question is which investments are currently adequate.

The links between the building industry and economic cycles are normally argued. The question is whether there is a change in the type of investment: from so-called “hard” investments represented by building industry to so-called “soft” investments associated above all with TIT sector.

The following Figure 4 represents global share development of ISIC F and ISIC I to TVA which contains break sessions of share relations of both sectors (1884-1989). Table 4 summarizes the descriptions of the phenomenon of the selected countries.



**Figure 4.** Development trends of shares ISIC F and ISIC I to TVA

Source: own elaboration based on data processing [cit. 31.12.2009] Available from: World Wide Web: <http://unstats.un.org/unsd/snaama/dnlList.asp>

**Table 4.** Period of change relation between share ISIC F and ISIC I

<b>world</b>	1984-1989
<b>USA</b>	1975-1977
<b>Chad</b>	approximation 2003-2004, share I is still bigger and increases slightly faster than F
<b>Japan</b>	1997
<b>Europe</b>	1987-1990
<b>CR</b>	1992-1996
<b>Lithuania</b>	approximation 2000-2001, share F is bigger, it increases significantly faster until 2007
<b>Latvia</b>	The closest in 1990, then until 1993-94 significant increasing of share I and decreasing of share F, then opposite trends, I still has a bigger share than F
<b>Brazil</b>	Approximation in 2005, F still has a bigger share than I
<b>Russia</b>	The closest in 1990, then until 2002 share decline of both sectors, whereas I has a bigger share than F, growth F since 2002, which approximates I
<b>India</b>	1974-1981
<b>China</b>	Similar trends in both sectors between the years 1975-1981, then until 1993 I has a bigger share than F, increasing share of F after 1993, decreasing share of I

Source: own elaboration based on data processing [cit. 31.12.2009] Available from: World Wide Web: <http://unstats.un.org/unsd/snaama/dnlList.asp>

### Trends in sectors aimed at improving human welfare

In addition to the above obvious trend change of both “investment” groups in selected countries, it is necessary to define trend development of the “branches aimed at improving human welfare” (ISIC J-P) on

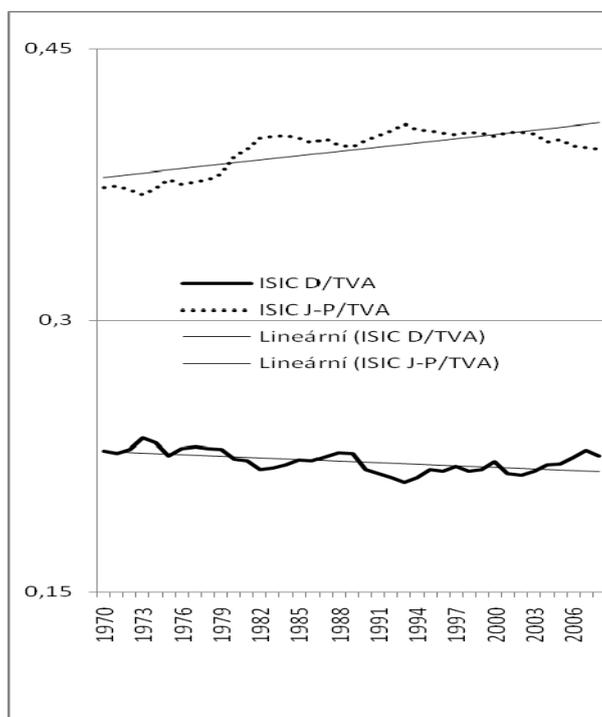
the one hand and on the other hand it is necessary to define dominant economic structure ISIC D (industry); in backward economies also branches of the primary sector (ISIC A-B).

Table 5 is a brief description of the situation in the selected countries. Figure 5 illustrates the global trend of the groups in the sector.

**Table 5.** Relation of ISIC D and ISIC J-P in terms of share on TVA

<b>world</b>	1976
<b>USA</b>	1977
<b>Chad</b>	1998, besides that the year 2004 is marked by an enormous increase in the share of E+C and an enormous decrease in the share of A+B, then change in trend
<b>Japan</b>	since 1970 trend of increasing share ISIC J-P and decreasing share D, the exception is the year 1991, which means distortion of the trend
<b>Europe</b>	1989-1990
<b>CR</b>	majority ISIC J-P proportion of ISIC D in 1991, then decrease in J-P and increase in D, the year 2006 is breakthrough, J-P share is smaller and decreasing, share of D is bigger and increasing
<b>Lithuania</b>	Since 2000 until 2007 decrease in J-P and increase in D (at the same time enormous share decline A+B), share increase J-P after 2007 and share decline D
<b>Latvia</b>	Turning point occurred in 1992-93, when the share J-P was significantly bigger, after 1993 moderate share decrease of both sectors, in addition a significant share decrease A+B
<b>Brazil</b>	1973
<b>Russia</b>	Between the years 1993-2003 share of J-P exceeds share of D, after 2003 shares are in equilibrium; group C-E of the sector develops specifically
<b>India</b>	1996, accompanied by a decline in A+B, which decreased in 1997 below the share J-P and in 2005 below the share D
<b>China</b>	Steady increase in shares of both groups D and J-P is accompanied by a decline in A+B, its share is smaller than share of D in 1984 and in 1995 smaller than share of J-P

Source: own elaboration based on data processing [cit. 31.12.2009] Available from: World Wide Web: <http://unstats.un.org/unsd/snaama/dnlList.asp>



**Figure 5.** Global development trends of shares ISIC F and ISIC I to TVA

Source: own elaboration based on data processing [cit. 31.12.2009] Available from: World Wide Web: <http://unstats.un.org/unsd/snaama/dnlList.asp>

## Conclusions

Cyclic character of reaching dynamic equilibrium continues even in the environment of a significantly globalized economy in the period after 1970. The most complex regional decline was confirmed in 2008.

It is possible to confirm temporality of Juglar business cycles by the measurement of GDP. Their causes and consequences are influenced by subjective anomalies which react against objective development processes, both quantity and quality of the used technological progress and socioeconomic changes for example in Europe after 1990.

None of these moments does eliminate ongoing investments impact, even with regard to their significantly modified target. The sector structure of gross values added shows the changes which can be marked as a transition from "hard" investments to "soft" investments. At the same time (in the context of the overall growth of global economy performance even by the declining efficiency of investment), it shows the change of the gradual transition from putting accent on material goods production to services.

## Acknowledgement

This article was prepared with the support of the Grant Agency of the Czech Republic in connection with solving the research project No. 402/09/0592 „Development of economic theory in the context of economic integration and globalization“ and the research project No. 402/08/0849 “Model of management of sustainable region growth”.

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