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ANALYSIS OF INVESTMENT RATE AND EFFICIENCY IN CR (1995-2006)

1. GFCF development in CR in 1995-2006

We shall first follow investment development in current prices.

Table 1. GFCF in 1995-2006 Altogether and According to Selected Sectors (current prices, CZK billion)

	1995	1998	1999	2000	2001	2002	2003	2004	2005	2006
GFCF total	462	562	562	613	659	678	688	727	746	795
Selected sectors:										
A. Agriculture and forestry	20	17	13	17	21	21	17	19	20	19
B. Mining and quarrying	9	8	7	7	10	9	7	7	7	8
C. Manufacturing	101	121	127	143	163	160	165	192	176	183
D. Electricity, gas and water supply	61	55	56	46	46	38	43	36	40	43
E. Construction	13	18	15	17	27	23	25	23	19	22
F. Wholesale and retail trade; repair of motor vehicles and personal and household goods	32	52	67	48	54	54	56	55	62	62
G. Transport, storage and communication	52	103	99	115	130	105	108	118	142	151
I. Financial intermediation	27	17	13	17	14	18	16	15	11	9
J. Real estate, renting and business activities	77	111	101	123	111	143	132	149	156	167
K. Other	67	54	57	71	78	97	104	105	102	110
From this:										
Education	5	5	9	12	13	14	14	15	17	18
Health	8	9	14	17	21	23	21	24	21	19

Source: [*Ukazatelé sociálního...* 2007 p. 21; *Statistická ročenka...* 2006, pp. 182-183]. Summary of selected sectors is not equal to GFCF altogether.

GFCF amounted to 795 CZK billion in 2006. In comparison with 1995 (462 CZK billion) expenditures for gross investments in fixed assets increased about more than 75%.

Long-term growth of GFCF is however connected with its strong interannual variations, which is proven by considerable interannual changes in %.

Table 2. Interannual changes in %

	1996	1999	2000	2001	2002	2003	2004	2005	2006
GFCF	16,8	0	9,1	7,5	2,9	1,5	6	2,3	6,5

In theory emphasized thesis about great investment instability is often confirmed. Their dynamics is resultant of functioning of many effects from the technical and technological sphere, from the financial – economic sphere and from economic policy sphere.

Investments fluctuation in CR concerning observed period 1996-2006 has character of some investment waves, which after strong one year raising (1996, 2000, 2004) are followed by stronger or slower decreasing of interannual increases in course of following three years. Average interannual rate of GFCF concerning observed period was about 5,3%.

Focus of investment activities in CR is concentrated namely in manufacturing (in 2004 more than 26% of total GFCF), in transport, storage and communication (more than 16%) and in sector of real estate and renting (more than 20%). Lowest volumes of investments in 2004 are characteristic for mining of mineral raw materials sector (less than 1%), financial intermediation (cca 2%), sector of agriculture, hunting and forestry (over 2,5%) and construction (over 3%).

If we compare investment dynamics in observed period (1995-2006) of individual sectors, highest GFCF accessions appeared in sector of transport, storage and communications (by 190%), in real estate and renting activities (by 116%), in manufacturing (by 81%) and in repair of motor vehicles (by 93%). It is also necessary to draw attention to high investment dynamics in education and health: in both sectors GFCF in 1995-2006 increased cca three times.

Decrease in GFCF in 1995-2006 occurred in sectors of financial intermediation (by 66%), electricity, gas and water supply (by 30%), mining of mineral raw materials (by 11%) and agriculture (by 5%).

Decrease of absolute investment level in these sectors was caused by various factors. In financial intermediation sector in investment decreases participated namely reduction of banking entrepreneurial subjects and transit to internet banking (less demanding for investments). Completion of construction of big power engineering projects (Temelín) had a great impact on sector of electricity, gas and water supply. It has decreased investment activities of energetic enterprises for a certain time. In mining of mineral raw materials it is a long-term structural change in Czech

economy. It is a decline of mining and adjustment of ores, investment reduction in coal industry. Also it is due to strengthening of technically and technologically more advanced sectors and services.

It is important to take a look at dynamics of investment level in accordance to a trend of investment share in new machines and equipment on total GFCF. Following stating date imply slight increase of these investment shares on total GFCF, which is indisputably positive tendency¹.

Table 3. Investment share in new machines

	1995	1998	1999	2000	2001	2002	2003	2004	2005	2006
Acquisition of new machines and equipment in billion (current prices)	194	248	263	303	329	333	315	325	–	–
GFCF in billion (current prices)	461	562	562	613	659	678	688	727	746	795
Participation of new machines in %	42,1	44,1	46,8	49,4	49,9	49,1	45,8	44,6	–	–

Quite considerable changes appear in 1995-2006 in sector structure of GFCF. Slightly decline of share of non-financial firms and grow share of government and domestic investments.

Within the framework of non-financial firms sector special attention is paid to investment dynamics in its subsector “non-financial firms under foreign control”.

Non-financial firms under foreign control started assume in 1995-2005 ever growing share in economic results of non-financial firms in CR. (In 2005 share of these firms on total profits before taxation reached almost 50%)². This reality has an impact on development of firms’ investment under foreign control.

Table 4. GFCF (CZK billion, current prices) in 1995 and 2004

	1995	2004	Index
GFCF non-financial firms under foreign control in CR	32	183	5,71
GFCF in CR total	462	729	1,57

Source: [Statistická ročenka... 2006, p. 45; Investice a ekonomický... 2006, p. 36] and own additional calculation.

¹ [Statistická ročenka... 2006, pp. 169, 182, 183, 186, 187] and own calculation.

² [Revidované ekonomický... 2006, pp. 15-22] and own additional calculation.

While total investments in CR increased by 57%, firms' investments under foreign control increased by 471%. This is an absolutely remarkable growth of investments, which had an impact on extraordinary strengthening of firms' economic position under foreign control in CR. This growth in near future will continue to influence their position in Czech economy.

At the same time it is necessary to say that firms' investment under foreign control are from 90% created by new fixed assets, which indisputably favourably affect their effectiveness.

Investments in manufacturing industry in CR were growing, as quoted before, more quickly than investments in total economy: in course of 1995-2006 increased by 83% (from 101 CZK billion in 1995 to 183 CZK billion in 2006) meanwhile GFCF in CR increased by 72% (from 462 CZK billion to 795 CZK billion). From faster investment growth in manufacturing industry we can probably derive further strengthening of importance of this sector in total economy in CR at formation of GDP in future.

Most important drawer of investments in manufacturing industry became production of transport equipment. Its investments take part in all manufacturing industry investments in 2004 by more than 21% and increased comparing with 1995 about more than 300%. Similarly high growth of investment activities shows production of electrical and optical equipment (by 340%). Low growth or almost investment stagnation and great decreasing of their share in total investments in manufacturing industry we can state in manufacture of textile products. Investments in this sector increased comparing with 1995 only by 20%.

Even more expressive is stagnation in manufacture of chemical products and fibres. Expressive decreases or investment stagnation in this sectors are caused namely by hard foreign competition in consequences of extending economy globalisation (production of textiles, production of leather and leather products).

Development of GFCF is useful to follow-namely at higher inflation and for international comparison – also in comparable prices.

Total investment dynamics in CR in comparable prices indicates the following table.

Table 5. GFCF in 1995-2006 (comparable prices 2000, CZK billion)

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
GFCF	586	644	608	603	583	612	653	686	689	716	733	788
Interannual growth in %	–	9,9	–5,6	–0,8	–3,3	5,1	6,5	5,0	0,4	3,9	2,3	7,5

Source: [*Ukazatelé sociálního...* 2007, p. 22] and own additional calculation.

In comparable prices total GFCF increased from 586 CZK billion in 1995 to 788 CZK billion in 2006, almost 35%, which is by 40 percentage points lower growth than in current prices.

Even from this comparison of investment dynamics by means of comparable prices it is possible to derive great investment instability in CR. This instability is characteristic by still deeper investment waves, than at comparison of interannual investment changes by current prices. After highest investment increasing in 1996 (9,9%) followed interannual decreases in 1997-1999. Subsequently after great increasing in 2000-2002 came strong deceleration of GFCF in 2003 (0,4%).

Average interannual growth of GFCF covering whole period 1995-2006 amounted only 2,2% (comparing with 5,3% at valuation in current prices).

As for sector structure of investments, sector composition of investments in manufacturing industry exist for their characteristic by means of comparable price approximately the same quantitative conclusions as in characteristics by means of current prices.

2. Investment rate

In last years Czech economy has been characterized in long-term by high investment rate, comparing with majority of EU or OECD countries. Evaluation of this reality is difficult because a lot of antagonistic factors reflex in it. On one side high rate of investment creates important presumption for further economic growth. Some models of economic growth even comply with investments decisive role in economic growth, consider investments as decisive determinant of GDP growth.

CR wants substantially decrease backwardness behind average economic standard of 25 EU countries (for 2006 is Eurostat estimation 76% of average GDP per capita in purchasing power parity) and behind standard of average productivity of later per employee (for 2006 Eurostat estimate 68% of GDP average per employee). Therefore higher investment rate appears objectively as necessary factor for decrease of these discrepancies.

Table 6. GDP in CR in 1995-2006 (CZK billion)

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Current prices	1467	1683	1811	1996	2081	2189	2352	2464	2577	2817	2994	3220
Comparable prices	2034	2116	2100	2084	2112	2189	2243	2285	2368	2476	2637	2805
Interannual growth index	–	104,1	99,3	99,2	101,3	103,6	102,4	101,9	103,6	104,6	106,5	106,4
σ of growth	2,35											

Source: [Ukazatelé sociálního... 2007, pp. 20-22] and own calculation.

On the other side it is evident, that only high investment rate by itself need not secure high standard of GDP per capita. Likewise important, if not more important factor of economic growth, is effectivity of investments, structure of these investments, especially investment share in sector of information and communication technologies – ICT. If effectivity of investments is low or stagnate, if share of new technologies falls behind, than even at high investment rate growth of GDP can be low, event. zero.

Development of investment rate (expressed as ratio GFCF to GDP) in last 11 years shows the following date.

Table 7. GFCF in CR in 1995-2006 (CZK billion)

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Current prices	462	540	542	562	562	612	659	678	687	727	746	813
Comparable prices	586	644	608	603	583	612	653	686	689	716	733	788
Interannual growth index	–	109,1	94,3	99,1	96,7	105,0	106,7	105,1	100,4	103,9	102,4	107,5
σ of growth	8,48											

Table 8. Investment rate in %

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Current prices	31,5	32,1	29,9	28,2	27,0	28,0	28,0	27,5	26,7	25,8	24,9	25,2
Average	27,9											
Comparable prices	28,8	30,4	28,9	28,9	27,6	28,0	29,1	30,0	29,1	28,9	27,8	28,1
Average	28,8											

On the bases of above stated GDP and GFCF rate of growth and investment rate we can relatively explicitly form development tendencies in CR:

1. GFCF development is more variable, more unstable than GDP development. Interannual rate of changes, expressed by interannual indexes in comparable prices are at GFCF more expressive than at GDP. Volatility of this capital (expressed by standard deviation) is more 3,5 times higher than volatility of GDP. It is confirmed that investments are, no doubt, important, but not the only factor determinating development of economic level of CR in last 11 years.

2. In long term in CR decreases investment rate. Investment rate (expressed in current prices) decreased by 6,3 percentage points, in comparable prices is decrease slighter by 0,7 percentages points. Within the framework of observed time series however decrease investment rate by two different ways:

a) In 1997-1999 decrease of investment rates (from 30,4% to 27,6%) copies decrease or stagnation of GDP.

b) In 2002-2006 decrease of investment rate (from 30% to 28,1%) is accompanied by relatively strong interannual increase of GDP.

It is without doubt positive tendency, which may be beginning of decrease of otherwise high investment rate in CR on level of developed countries EU or OECD.

3. Average investment rate in CR remains considerably high. In 1995-2006 reached in calculation by means of current prices 27,9%, by means of comparable prices even more – 28,8%.

With this investment rate CR belongs (together with Slovakia, Spain and Estonia) to countries, which for a long time highly exceed investment rate, usual in developed countries. It moves in last years approximately around 20% [Sedláček 2006, p. 21].

High investment rate in Czech economy is acknowledged by further official statistical data, which follow the share GFCF private sector on GDP. In 2000-2004 in selected countries of EU reached the following level [*Statistická ročenka...* 2006, p. 759].

Table 9. Share of GFCF in Private Sector on GDP in %

Country	2000	2004
EU 25	18,3	17,1
From this:		
Sweden	14,7	13
Poland	21,4	14,6
United Kingdom	15,7	14,8
Finland	16,8	15,4
France	16,3	15,9
Germany	19,7	16,0
Holland	18,9	16,3
Slovakia	23,0	21,7
Czech Republic	24,7	22,6
Spain	22,8	24,5

Permanently high, only slight decreasing investment rate in CR in last years creates conditions for further growth of GDP in future, but in itself doesn't secure this

growth automatically. Its possible positive influence on GDP growth can be strongly suppressed by low effectivity of investments.

3. Investment effectivity in CR

Identification of investment effectivity on macroeconomic level is in theory and praxis continuous subject of discussions and various analysis.

It is not purpose of this short study to be engaged in them and evaluate them. For appreciation of investment effectivity in CR from macroeconomic point of view we shall use methodical access of OECD in form of so called “Incremental Capital Output Ratio” (ICOR), which is used in various analyses and OECD comparisons.

ICOR compares GDP increment with investments in whole economy. Shows how many investment units fall on increment unit of GDP:

$$\text{ICOR} = \frac{\text{Investments}}{\text{Increment of GDP}} .$$

The less investments fall on unit increment of GDP, the higher is evaluated effectivity of investments in the whole economy. For investments value in numerator we shall consider GFCF in CR. Increment of GDP we express an interannual increment. Both in comparable prices of 2000. Than we shall get following characteristics of macroeconomic investment effectivity in CR in last 11 years³.

Table 10. GFCF belonging to GDP increment unit in CR

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
GFCF in CZK billion (comparable prices)	586	644	608	603	583	613	653	686	689	716	733	788
ΔGDP in CZK billion (comparable prices)	–	82	–16	–16	28	77	53	43	82	108	160	168
GFCF/ΔGDP	–	7,8	–38	–37,7	20,8	7,9	12,3	15,9	8,4	6,6	4,6	4,7

GFCF effectivity developed very variably. Lowest effectivity has been reached in 1997-1999 (in 1997 and 1998 come to absolute decrease of GDP). Most favourable effectivity is possible to notice in last three years.

While international comparisons of investment rate are in analysis very often mentioned and evaluated, international effectivity comparisons of total investment

³ Calculation is derived from initial dates, publlicted in [Ukazatelé sociálního... 2007, pp. 20, 21].

occurs rarely. However some numbers in last periods indicate, that in comparison with developed economics, in CR evaluated GFCF is on a decent level : “Most effective investment has Ireland (0,53) followed by Finland and USA, which have ICOR also under unit level (0,99, resp. 0,98). Further then Sweden, Great Britain or Eurozone have ICOR round 1,5” [Sedláček 2006, p. 22].

Even though above given date can be doubted, after all diametrically worse effectivity indicator of Czech investments in comparison with the world indicates, that GFCF effectivity in CR can't be evaluated as positive.

Analysis of causes of less investment efficiency in CR is exceeding character of this contribution.

Finally some of the reasons of GFCF effectiveness in CR compared to other, developed countries can be shown.

Great role here has investment structure. For CR the nineties are characteristic by considerable investments in infrastructure and improvement of environment. It is a response to investment stagnation of this kind in central controlled economy of fifties to eighties last century. (Only investments in transport sector in 1995-2005 doubled). Pay-back period of such investments is very long, difficult economically interpreted and shows in following decades. It manifests also in higher quality of inhabitants life and in improvement of health and other parameters, which immediately don't affect GDP.

Substantial role in frame of investment structure have investments in information and communication technologies sector (ICT sector), which are decisive for ensuring of effective growth. Share of these investments in last years in CR grows. Its total level is estimated at 20% and strongly falls behind similar investments in developed countries.

Unfavorable effects on GFCF effectiveness have some high costs connected with building of highways and railway corridors. Last analyses prove that prices for example for building of highway are in CR comparable with surrounding countries. However state pays gigantic amounts for ecological constructions and so-called “social investments”.

GFCF effectiveness influence unfavourably some further facts. It is e.g. low share of investments in science. (CR in 2006 invested in science from public finances 0,52% GDP, which is under average of all EU countries (0,65% GDP)). Private firms invest in research and development in CR 0,92% GDP. Firms e.g. in Finland 2,46%, in Denmark 1,67% [Benešová, Zlámalová 2007].

4. Conclusion

1. GFCF in CR in 1995-2006 is expressed by long-term character of growth (interannually over 5,3%). However it is accompanied by strong interannual fluctuations. This fluctuation has approximately character of three-years investment waves.

2. Forms of investment activities in CR are concentrated namely in manufacturing, transport and communications, as well as in real estate and renting. Lowest share in total investments have sectors of mining and quarrying, financial intermediation, agriculture and construction.

3. Greatest GFCF dynamics is in sector transport and communication, manufacturing, real estate and renting as in trade and repair of motor vehicles. On the contrary in sectors financial intermediation, electricity, gas and water supply, mining and quarrying, agriculture appear differently significant investment decrease.

4. GFCF in observed period is accompanied by slightly increasing share of new machines and equipment.

5. From the point of view of sector composition analysis proves, that dominant role in GFCF has sector of non-financial firms. Its share in total investment in CR slightly decreased.

6. Extraordinary dynamics of investments have non-financial firms under foreign control. Their investments increased more than five times, while investments in whole CR only 1,5 times.

7. Most significant drawer of investments in manufacturing in 1995-2004 became production of transport equipment. Here GFCF increased about more than 300%. Strong investment boom is registered also in production of electrical and optical equipment. Low growth or stagnation of GFCF are typical for manufacture of textiles and textile products, shoes and most of all for manufacture of chemicals, chemical products, fibres and medicaments.

8. Development of GFCF is in CR more variable than GDP development. It means, that investments are, no doubt, important, but not a single factor determining economic development.

9. In long-term appears in CR decrease of investment rate. In last three years is this decrease accompanied by strong growth of GDP.

10. Average investment rate in CR remains still considerably high comparing with developed countries.

11. High investment rate has not adequate reflexion in GFCF effectiveness. It develops very variably. More favourable results in investment effectiveness have been achieved in last three years.

12. Comparing to developed economics GFCF effectiveness in CR, measured through ICOR indicators, stays strongly.

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ANALIZA STOPY ZWROTU I EFEKTYWNOŚCI INWESTYCJI W REPUBLICIE CZESKIEJ

Streszczenie

Artykuł porusza problematykę inwestycji w środki trwałe w Republice Czeskiej w latach 1995-2006 w całej gospodarce oraz w jej głównych gałęziach. Zaprezentowane zostały zmiany poziomu i charakter inwestycji w środki trwałe w badanym okresie. Inwestycje w instytucjach niefinansowych znajdujących się pod kontrolą kapitału zagranicznego są najbardziej efektywne. Zaprezentowane zostały również dynamika i poziom stopy zwrotu z inwestycji w Republice Czeskiej i porównane z odpowiednimi wskaźnikami państw wysoko rozwiniętych. W artykule autor podejmuje próbę wskazania głównych determinant niskiej efektywności inwestycji w środki trwałe w Republice Czeskiej.