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Industrial Restructuring in the Budapest Agglomeration

by

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Preface

During the transition from the state-planned economy to a market economy, the Hungarian industry has fundamentally changed: Its "physical" size has radically decreased, but after a few years of a deep recession, industrial production began to increase again. The industry has undergone some thorough restructuring, its network of connections has become disaggregated, and it began to rebuild itself.

Budapest's position is exceptional within the national industrial framework. After a deeper recession and a slower recovery than the national average showed, Budapest still represents the largest industrial concentration within Hungary. It is uncertain, however, whether the main reason for the deeper industrial recession was that Budapest followed a Western city-model with its radical process of de-industrialisation, or rather more the gradual economic/industrial transformation (from the state-planned economy to a market economy) that took place at the same time.

There is other open questions: Will the result be a unique Eastern European/Hungarian model, or will this region not be able to avoid the problematic path of development of the South-Asian industrialising countries? According to another scenario: Will Hungary's and Budapest's economy emulate the growth of handicraft-type industries similar to the so-called Italian model?

This work was supported by the Research Support Scheme of the Open Society Institute (OSI/HESP, grant no. 1552/1997). Its purpose was to show the changes in the industry of the Budapest agglomeration, and to sketch probable future trends. Finally, we also wanted to tentatively answer the questions above... Research on this developing phenomenon cannot, by any means, be definitely covered by this study. But it would be important to use the results of this type of research for drawing up development concepts for Budapest and its agglomeration.

I would like to thank Thomas R. Richers and András Szigeti for discussing, translating and digitising some elements of this study.

Györgyi Barta

Budapest, 13 September 1999

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1. Introduction

1.1. Possible future paths for the Hungarian economy

After the change of the political system many a prognosis has been written about the future possibilities of Central and Eastern European economies in general and the Hungarian economy in particular. However, the entire region - and Hungary is not an exception - has not followed those early forecasts. The Hungarian economy, for example, has changed much more dynamically and in a more promising way than had been expected. Nowadays we are not dreaming anymore about its peripheral or semi-peripheral situation in the developed world, but much more about its potential role in bridging the gap...

H. J. Dunning (1993) refers to three possible models, or scenarios, of development in Central and Eastern Europe:

- the developing-country model,
- the reconstruction model,
- the systemic model.

The developing-country model starts from the assumption that the countries of Eastern Europe will develop along similar lines as the 'emerging' industrialising countries such as Brazil, Mexico, Malaysia, South Korea, Taiwan and Singapore. The reconstruction model takes West Germany and Japan after the Second World War as examples. And, finally, the systemic model combines the two models mentioned above. All three models are based on the assumption that foreign direct investment will be there to assist in the process. The systemic model offers the hypothesis that the speed, structure and quantity of FDI will somehow adjust automatically to the absorption capacity and willingness to make good use of FDI on the part of the host countries (Hans van Hostenberg, 1999).

Before examining the validity of these models, we have to first realise that Central and Eastern Europe is not a homogenous region anymore, as its countries have developed in very different ways during the past

decade. To begin with, we can divide this region into two parts, the more developed countries, such as Poland, the Czech Republic, Hungary, Slovenia as well as Slovakia, and a less developed area (Romania, Bulgaria, Yugoslavia, etc.).

Secondly, the development path chosen by each country was directly related to the actual situation that groups of the countries found themselves in at the time - just as the starting conditions of the countries of South America and Southeast Asia were profoundly different from those of West Germany or Japan... So it is important to underscore the importance of the respective starting conditions in order to decide whether we can compare the developments of the countries of Central and Eastern Europe at all. Applied to our study this means what criteria to use for assessing Hungary's development, in particular.

According to J. Kornai (1993) the centrally planned economies were rather mis-developed than un-developed. As a consequence, we have to analyse what were the starting conditions of these economies, what did the centrally planned system distort or what did it destroy irreversibly, and what were the usable assets left after the change of the system. As a next step, we have to examine whether any of the Central and Eastern European ex-socialist countries, especially any of the more developed countries, found, created or followed a model significantly different from the three models mentioned by Dunning.

Thirdly, the above development models are mostly described as positive examples. No doubt, the countries of Southeast Asia managed to rise from the periphery of the developed world to the category of semiperiphery during the second part of the 20th century. For several decades, their development was the most dynamic in the world. But today it is justified to ask if the South Asian, i.e. the developing-country, model really provides a developmental scenario worth following.

After the still unresolved monetary, capital and economic crises in this region, this model may be discarded as a "dead-end street" because of the excessive influence of the state in the economy, the crippling corruption and nepotism which are perhaps cultural phenomena, but are definitely

incompatible with economic efficiency standards valid in the West. In other words, to emulate a successful Western economy requires taking over the entire set of values, procedures, restraints of state involvement and a preparedness to be an integral part of a globalised economy.

The developing-country model, when applied to Central and Eastern European countries, is questionable also from another aspect: It seems that its competitiveness can be maintained only by rock-bottom wages and other ways to keep costs of production low such as not caring for sustainable growth, but rather relying on the exploitation of all available resources. This cannot be a long-term strategy, if only from an ecological point of view. As the Asian development shows, poor domestic consumption due to low-income consumers returned the former "tiger economies" to stagnation or backwardness. Apart from other massive financial, structural and political shortcomings, it was the dependence on mass-production by cheap, unskilled labour for a global market that unveiled the inherent weakness of the short-lived South-East Asian economic miracles (Cséfalvay, 1999).

Finally, the host countries, i.e. those who are hoping for FDI, cannot direct, but only influence, the purposes of foreign investors in a limited manner. It is possible to hamper FDI as happened, for example, in the Czech Republic, but to stimulate the influx of foreign capital, if the political, social and economic situation of the host country is unstable or even hopeless, is almost impossible (Yugoslavia, Romania, Bulgaria or the Ukraine, for example, have a bad stand in this respect), and to affect the structure of any FDI is practically out of the question.

As the last decade has shown, none of the Central and Eastern European countries really had a choice to opt for a "model". But sound problem-solving and a credible foreign policy pay off. It is obvious that the Hungarian economic policy has stimulated FDI from the beginning, creating attractive circumstances for foreign capital in Hungary. But other conditions such as a stable political situation, a market system much more matured than in the other ex-communist countries, a more developed infrastructure, etc. also contributed to the fact that Hungary was able to attract almost half of all foreign direct capital invested in Central and

Eastern Europe after 1989. Per capita it still has the highest rate of FDI, topping Poland, Ireland, Japan.

Not all experts share the opinion about the exclusively positive influence of FDI on host countries. The dependency theory (Wallerstein, 1986) states that the host economy controlled by foreign capital cannot develop organically. This means that linkages would not emerge in a natural way, income inequalities would polarise society, the economy would become more vulnerable and exposed to international economic developments, the majority of profits would be expatriated, and the economy could not develop in a healthy way. The key point (and the answer to the dependency theory) must be, however, whether FDI helps the technological development, the "bridging-the-gap" process and the overall modernisation of the host country or not.

Hungary seems to have reached a turning point in its economic development. The next years will show whether Hungary is able to develop along a path different from that of the industrialising East-Asian countries (if this should have been the case until now) and develop economic characteristics similar to those found in developed West European countries or not.

1.2. Bridging the gap and the industrial development in Hungary

The present organisational transformation of the Hungarian economy has been characterised by a bipolar industrial structure. Companies and sectors that have been successfully integrated into transnational networks and boast rapid growth represent one extreme. These enterprises are for the most part owned by multinational companies. It is estimated that this group of companies accounts for 60-70% of overall industrial growth in Hungary. The number of small and medium-sized enterprises linked to multinational companies has slowly started to increase as well, especially in car manufacturing, electronics, the paper and packaging industries. By contrast, the majority of firms are located at the opposite 'pole'. Their production is either stagnant or increasing only at a very slow rate, and their progress in technological innovation is poor. These companies

manufacture only for a small domestic market. (A similar classification of firms divides enterprises into non-export-oriented, assembling-exporting and export-oriented domestic companies (Éltet and Sass, 1997).

Several case studies and research projects have demonstrated that the integration of foreign companies in the Hungarian economy, those of multinational companies in particular, is a very slow process. At the same time, it would be appropriate to characterise these enterprises as isolated enclaves. Connections between companies representing the two poles of Hungarian economy, i.e. enterprises producing for the domestic market, mostly in Hungarian ownership, on the one hand, and multinational companies together with their subcontractors, on the other hand, are quite limited. Furthermore, subcontractors of multinational companies are often foreign companies themselves; domestic enterprises play a fairly minor role in the new division of labour (mostly in manufacturing activities requiring low technological standards and an unskilled, cheap workforce).

What is described above are the general processes that determine overall technological standards in the Hungarian economy as well as its relative position in comparison to leading economies. There is no doubt that the initial emergence of foreign direct investments as well as its by now enormous contribution to production have had a highly stimulating effect on the Hungarian economy. Economic growth and the expansion of exports is mostly due to this set of companies. Their technological standards often involve the actual import of the latest manufacturing technologies and processes, but are in any case more advanced than the Hungarian average.

Such state-of-the-art standards, however, are spreading very slowly through the economy. This is primarily explained by the fact that an increasing differentiation of companies and a peculiar division of labour characterises the domestic economy. In other words, even though large foreign companies are rightly regarded as 'motors' of the Hungarian economy, the slow diffusion of higher technological standards is to be attributed to their slow integration in the domestic economic environment. (Barta, 1999).

1.3. Potential models for the industrial restructuring in Budapest

The bridging-the-gap development process affects the metropolis of Budapest differently than the towns in the countryside. There is an endless discussion among the experts (urban planners, economists, sociologists, geographers and politicians) about what the characteristics of the developmental tendencies in Budapest economy are. What sort of pattern of world cities can the economic/industrial development of Budapest be identified with?

- Has Budapest followed the well-known *Western city model with its radical process of de-industrialisation*? As we shall see in the details of this study, there are unambiguous signs which verify this statement such as the dramatic decrease in the number of industrial employees, the physical contraction of industrial space, etc. (Enyedi, 1998)

- At the same time, there is also some contradicting evidence. From the middle of the 90s, as industrial production and exports by the Budapest industry have actually increased. Foreign direct investments have been particularly more significant with regard to the industry of the capital than domestic investments have. In the new division of labour (both in the organisation of enterprises and between Budapest and its agglomeration belt) the role of the industry of Budapest seems to be strengthening.

Was the industrial recession of Budapest's economy in the early 90s caused by the transformation from the centrally planned economy to a market economy or by the de-industrialisation process? And after finishing the transformation of the economy, will there be a smaller-size industry with a modern structure and strategic importance forming in Budapest? Finally, can we state that a *re-industrialisation* has taken place in Budapest?

- The 'motors' of the recent Hungarian industrial development have been foreign direct investments, particularly those by multinational companies. They have stimulated a special development process, characterised on the one hand by the property structure after privatisation, greenfield develop-

ments, dynamism of production, exports, and profitability of the industry in Budapest. On the other hand, this basically caused the industry to split into foreign and domestic parts, or into the large, mainly foreign-owned companies and domestic SMEs. The big question is: Where is the Hungarian industry heading? Will the gap widen, i.e. will the drastic contraction of the weak domestic part continue, or will the gap eventually be bridged, with the domestic SMEs joining the foreign multinationals in a much more favourable scenario? *It means basically, that by avoiding the 'dead-end street' of South-Asian industrialising countries, whether a new Eastern European or Hungarian model will result.*

Such a model would without doubt be a fruitful and welcome fusion of accumulated knowledge, i.e. the rich human resources in Central and Eastern Europe/Hungary and the foreign direct investments. In the process Budapest would have an exceptional role, namely to provide the gateway and the bridgehead in the reception of the foreign input in order to spread it over the rest of the country. In industry, too, there are several effects to be observed. Not so much that industrial activity leaves the capital, but rather more that a new transfer role is developing: The FDI go (partly) into the industry of Budapest, i.e. foreign investors build their headquarters, distribution centres as well as a part of their production facilities there and, first of all, place the strategic elements such as control, managing, marketing, research and development functions in Budapest. To fulfil these functions a large subcontracting network has to be formed, which may stimulate the development of SMEs, again particularly in Budapest.

- There is, however, another scenario, differing from the former ones. It involves the growth of *handicraft-type industries* similar to the so-called Italian model. According to some opinions this would be particularly attractive for the Hungarian/Budapest economy, because it might avoid the negative consequences of globalisation (low wages and salaries, to remain a place for outsourcing less sophisticated assembly work, i.e. a long-run backwardness in general).

There is some evidence already that this scenario is to be taken seriously: According to the latest figures, more than 60% of all Budapest

enterprises, mainly the small and medium-sized enterprises, are belonging to two branches only, the machinery industry and the wood, paper and printing industries. These facts theoretically allow to form *industrial districts* within the Budapest industry, based on co-operation and division of labour. The accumulated industrial skill, the wide-spread entrepreneurial mentality, the high level of education and training, and the European surroundings, i.e. the economic and geopolitical proximity to the Western developed world give some chance to the "handicraft industrial hopes", at least in part.

Of course, we have to hasten to add that the Hungarian industrial heritage cannot be compared with the old, traditional industrial culture of the towns in the Italy of today. And, what is worse, 50 years of communism destroyed essentially this heritage that was one of Hungary's assets.

In addition, the lack of capital is seriously hampering the development of an Italian model, rendering the Hungarian economy very vulnerable.

And finally, the present international economic situation is quite different from what it was for the flourishing period of the Italian model (in the late 70s and 80s). The river it could enter now is no longer the same...

- *Summarising* the ideas and concepts about the present and the future of the Budapest industry, our opinion is that it cannot emulate any given model, and it is probably true, that the development of the Budapest industry cannot be regarded as a model proper. But nevertheless *this 'model' will be (or is) a mixture of different, elements* already mentioned: The proportion of the industry in the Budapest economy continues to decrease in the future similarly to the city development of Western Europe; but the remaining or newly established industries will become a more modern, more profitable sector than before; they will fulfil the technological transfer role between the developed World and the Hungarian countryside (or, perhaps, a larger region in Central and Eastern Europe); Budapest industry will be characterised by a special structure: A large subcontractor network will support the foreign big enterprises (multinationals) on the one hand, and industrial districts will be formed by SMEs in one or two sectors, on the other.

In all, it is certain that industry will continue to play an important role in the future of the Budapest economy.

2. Restructuring in the industry

2.1. Changing industrial resources

2.1.1. Industrial work force / employment

Before 1989

The size of the industrial work force in Hungary had experienced a steady growth since 1945. This trend was first reversed in Budapest, where the number of industrial employees began to decrease around the middle of the 1960s (Table 1).

Table 1

Decreasing industrial work force in Budapest (1965-1989)

<i>Year</i>	<i>Numbers</i>	<i>Absolute decrease</i>	<i>Absolute decrease (%)</i>	<i>Yearly rate of decrease (%)</i>
1965	620 313	-	-	-
1970	602 312	18 001	2.1	0.4
1975	519 936	82 376	13.7	2.7
1980	427 478	92 458	17.8	3.6
1985	341 852	85 626	20.0	4.0
1989	288 045	53807	15.7	3.9

Source: Budapest Statisztikai Évkönyvei (Statistical Yearbooks of Budapest), 1965, 1970, 1975, 1980, 1985, 1989. KSH (Central Statistical Office), Budapest.

It should be noted that the decrease in the size of the work force has not been limited to Budapest's industry, other sectors of Budapest's economy have also shown the same shrinking trend. The rate of decrease in these sectors, however, has remained far below the industrial figures mentioned above, while it is true that there has been a significant overall decrease in the number of the active population in Budapest's economy.

The following questions should be answered in order to account for the decrease in the size of the industrial work force:

- *What caused the decrease?*
- *Why did this process start in Budapest?*
- *Why was the decrease more significant in the industry than in other sectors of the economy?*

An analysis of the peculiar mechanism of the state-planned economy will provide the explanation to the processes described above. The state-planned economy has been driven by a continuous internal pressure to expand. Companies have displayed insatiable hunger for new investments in this economic environment. These investments have never involved any risk to companies in a state-planned economy, since there has been no correlation between the profitability and investments of a given company. The budget deficits of companies have always been balanced again by the state. Thus availability and accessibility of resources (physical resources, work force and capital) placed the sole restraint on investments. A continuous shortage of resources have remained characteristic of the state-planned economy all throughout its existence (Kornai, 1980, 1993).

It took state-planned economies a certain amount of time to absorb surplus work force. Large-scale investments in heavy industry have generated migration waves between various regions in the first period. The supply of work force has first started to dwindle in Budapest as early as the middle of the 1960s. Shortly after, however, large cities have also started to struggle with a lack of the required work force. Companies in search of additional work force have finally been forced to establish industrial units and branch plants for the non-mobilizable segment of the active population (Barta 1994).

It is no coincidence that Budapest has been first to experience the phenomenon of labour shortage. The economy of Budapest has always been the largest single industrial agglomeration in Hungary, showing dynamic development in the post-war period as well (in spite of the fact that the largest investments have been carried out elsewhere). The average increase of the work force of Budapest's economy has exceeded that of the national economy (Table 2).

Table 2

Increase in the number of the active population in Budapest and in the national economy

<i>Year</i>	<i>Number of active population in Budapest</i>	<i>Increase (%) (Previous year as 100%)</i>	<i>Number of active population in Hungary</i>	<i>Increase (%) (Previous year as 100%)</i>
1949	766 101	-	4 409 299	-
1960	983 897	128.4	5 295 700	120.1
1970	1 110 669	112.9	5 010 300	94.6

Sources: A főváros 120 éve 1873 - 1993. (The capital's last 120 years 1873 - 1993.) A KSH Budapesti és Pest megyei Igazgatósága (Central Statistical Office, Budapest and Pest County Departments), 1994. Statisztikai Évkönyvek (Statistical Yearbooks), 1950, 1971. KSH (Central Statistical Office), Budapest.

The natural increase of Budapest's generally ageing population could not fill the insatiable demand for additional labour. In addition, the level of employment in Budapest has always been higher than the national average. Hence the migration wave to the capital's economy from other more backward, predominantly agricultural regions.

Whatever the type of the work force, however, it can only be partially mobilised, even if it is not bound to a given locality through administrative regulations. To what extent the work force can be mobilised depends on the actual ratio of available jobs and those seeking employment. When there is an abundant supply of labour, or even a surplus work force, those seeking employment will naturally go wherever jobs are available. By contrast, when there is an excess in employment opportunities and shortage of labour, those seeking employment will be able to exercise their preferences and choose their place of employment near to their place of residence. A considerable part of those seeking employment will remain non-mobilisable in any case, but will be prepared to work locally.

Obviously, this process could have been influenced by regional differences in wages. Given the strictly regulated wage-system of the state-planned economy, however, in which wages were largely unrelated to performance (between individuals and companies as well as between sectors) and wage differences did not truly represent demand and supply on the labour market, the slightly higher wages in Budapest could less and less offset the advantages of being employed locally. One could thus save time and energy spent on long-distance commuting. Despite these developments, the share of commuters has reached unprecedented figures in Budapest's economy (Table 3).

Table 3

Increasing share of commuters in Budapest's economy

<i>Year</i>	<i>Number of commuters in Budapest</i>	<i>Share of commuters in Budapest's total work force (%)</i>
1960	139 402	11.7
1970	204 315	15.8
1980	205 062	17.0
1990	196 431	18.1

Source: Népszámlálás (Census) 1960, 1980, 1990, KSH (Central Statistical Office).

It has been noted above that the decrease in the size of the industrial work force was more significant than that in other sectors. Explanations which could adequately account for similar processes in a market economy prove useless in the present context, since there has been a very low correlation between the profitability of branches and companies, investment perspectives and actual wage-levels (Kornai, Matits 1986). It was decidedly not the case that weaker sectors and companies lost ground to more productive and profitable economic sectors and companies.

The higher rate of decrease in the industrial sector can only be explained by the discrepancies in the wage-system. Employers less bound by the rules of the regulative wage-system enjoyed a definite advantage in the 'struggle for labour'. Companies where employees could illegally or semi-legally increase their income had similar advantages. Thus the

private sector of the economy, private joint-enterprises and even co-operatives (this period saw the prospering of the subsidiary, usually industrial activities of agricultural co-operatives), which were independent of or only partly subject to state wage-regulation, as well as professions where tipping was customary (doctors, hairdressers, cabdrivers, etc.) could easily attract labour from large industrial companies, the workers of which belonged to the lowest income bracket.

Those working in professions deemed to be of strategic importance (leaders of the political and economic life, engineers, lawyers, doctors, etc.) have drawn salaries higher than the average in other areas of the economy, though the differences were not as great as usually found in market economies. These strategic professions were strongly concentrated in Budapest.

After 1989

The size of the industrial work force has decreased dramatically in Budapest after 1990, the number of jobs in Budapest's industry has halved once more between 1990 and 1994. Though it has slowed down somewhat, the same trend seems to be at work today (Table 4).

Table 4

Budapest's decreasing industrial work force (1990-1997)

<i>Year</i>	<i>Number of employees</i>	<i>Decrease in numbers</i>	<i>Yearly rate of decrease (%)</i>
1990	277 851	10 194	3.5
1991	239 104	38 747	13.9
1992	195 273	43 831	18.3
1993	164 797	30 476	15.6
1994	140 614	24 183	14.7
1995	126 902	13 712	9.8
1996	116 940	9 962	7.9
1997	109 835	7 105	6.1

Source: Budapest Statisztikai Évkönyve (Statistical Yearbook of Budapest), 1994, 1998. A KSH Budapesti és Pest megyei Igazgatósága (Central Statistical Office, Budapest and Pest County Departments).

In addition to the decrease in the size of the industrial work force, new indications of a contraction of industry have appeared. Changes have reached the company level, most spectacularly shown by the disintegration of the giant companies of the state-planned economy. Although this process had already started in the 1980s with the state-initiated breaking-up of trusts, the disintegration of large companies was accelerated when the transformation of company organisations became compulsory. (This compulsory reorganisation transformed traditional companies of the state-planned economy into corporations, i.e. state-owned companies operating in a market economy.) The various economic activities of large companies were separated and organised into independent company units in the process of this organisational transformation. It is understandable that this campaign, already complete by 1993, resulted in the fragmentation of large companies.

There are scores of examples to illustrate this process. The case of the Csepel Iron and Metal Works in Budapest, a company with a great tradition, is only one out of many. Approximately 30 000 people worked here in the 1970s. This trust was first split into 15 independent companies in 1983 and subsequently into 22 independent units in 1990. The original trust's assets are now shared between as many as 170 proprietors. (Nagy, Á., 1996)

The majority of large industrial companies went bankrupt by the combined effect of a market crisis (declining export markets, the collapse of the COMECON in particular, as well as a significant drop in domestic demand) and their inherited and quickly growing indebtedness, in short, they were unable to adapt to the new circumstances. (Barta, 1993)

Many companies had first closed their branch plants in the countryside, then laid off a part of their workforce at their company headquarters and were finally forced to shut down entirely. About 2500 companies went bankrupt between 1992 and 1995, 30% of which were headquartered in Budapest.

The turning point was in 1993, when the industrial production began to grow. (Table 5)

Table 5

Turning points in the development of the Hungarian economy after 1989

	<i>Year</i>
Industrial production	1993
Industrial productivity	1993
Domestic sales in industry	1993
Industrial export	1993
Investment into the economy	1993
Investment in industry	1992
GDP	1994
Increasing industrial employment	1996/97
Decreasing rate of growth in unemployment	1994

Source: Munkaügyi politika és munkaügyi folyamatok, 1994-1998, Munkaügyi Minisztérium; Az ipar termelési és értékesítési struktúrája 1985-97, KSH, Budapest, 1998.

The "first turning point" in 1992 has affected the labour market only 4-5 years later. The stagnation of the labour market or a very slight increase in employment in the manufacturing sector began in 1996 and 1997. This meant that in a few sectors of the industry restructuring had been completed.

In the Budapest agglomeration - where the number of employees decreased more drastically compared with the national average - the diminishing tendency continued even after 1996, but at a slower rate. Nevertheless, the biggest Hungarian industrial concentration is still to be found in the Budapest agglomeration - with approximately 130 000 jobs. However the division of labour between Budapest and its agglomeration belt has changed. There is a dynamic shift of industrial activity from Budapest into the agglomeration belt. The employment proportion of industry (29.6%) in the agglomeration belt has exceeded that of its population (24.5%), and in the towns of the agglomeration belt the number of industrial employees per capita has exceeded that of Budapest. However the administration of industrial companies is still concentrated in Budapest (with more than 70% of employees). (Table 6.)

Table 6
Industrial employees in the Budapest agglomeration, 1997

	<i>Distribution of the workforce (%)</i>	<i>Industrial employees per 1000 inhabitants</i>
Budapest	70.4	58
Agglomeration belt	29.6	51
Total	100.0	56

Source: A Bp-i agglomeráció az ezredforduló küszöbén, KSH. 1998, Budapest (Csabáné, 1998)

New industrial centres have been forming in the agglomeration belt (Gödöllő, Veresegyháza, Pomáz, Solymár, Ócsa, stb.), and a few among the old ones have strengthened during the last decade (Vác, Százhalombatta). (*Figure 1*)

2.1.2. Industrial space*

Before 1989 — spatial structure, a legacy of the past*

Budapest's industrial development started to gather speed in the last decades of the previous century. The framework of the future industrial structure took a definite shape as early as the turn of the century. The location of industry was to a great extent determined by the spatial layout of the transport network, especially that of the railway system as well as by the vicinity of the Danube. Industrial development before and after the Second World War hardly influenced the spatial structure of industry in any substantial way.

* This chapter is largely based on the study written by É. Kiss, Geographical Research Institute, Hungarian Academy of Sciences, 1999.

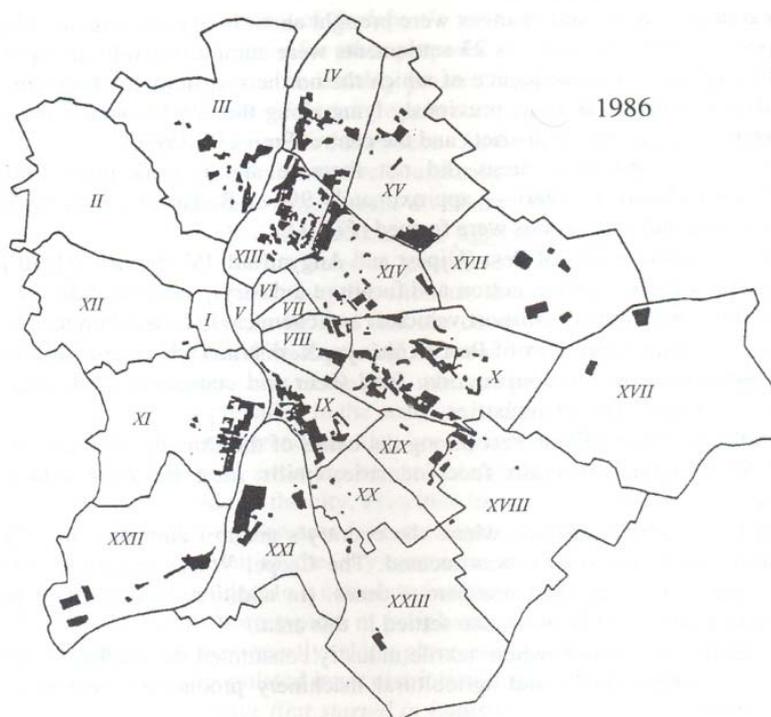
By contrast, significant changes were brought about by the creation of 'Greater Budapest' in 1950. As many as 23 settlements were administratively incorporated into the capital, as a consequence of which the northern-eastern-southern crescent of Budapest's industrial zone, previously lying along the city boundary, was now jammed between the outer districts and the centre. (Preisich, 1969)

The size of industrial areas did not increase significantly until 1980. It amounted to 45km² in 1986 — approximately 9% of Budapest's total territory. Characteristic industrial zones were formed (Fig. 1).

Figure 1
Traditional industrial districts

Figure 1

Traditional industrial districts



Source: Study for OTKA (FO16238), 1998; compiled by É.Kiss, Institute of Geography, Hungarian Academy of Sciences

Source: Study for OTKA (FO16238), 1998; compiled by É.Kiss, Institute of Geography, Hungarian Academy of Sciences

- In the northern part of Pest (Újpest and Angyalföld, IV. district) where light industry (shoe, leather, cotton and furniture industry), machine industry (low voltage electronics, transport vehicles) and chemical industry dominated.
- In the southeastern part of Pest (Kőbánya, X. district) where production was concentrated in the construction, food (beer and conserved food) and machine (Ganz-Mávag) industries.
- In the southern part of Pest (along the banks of the Danube, districts IX and XX) attracting especially food industries (mills, meat and canned food industries).
- In Csepel (XXI. district) where the country's greatest company, the Csepel Iron and Metal Works, was located. The Csepel Works employed 30 000 people during its most prosperous times. (In addition, an important paper factory and a textile plant also settled in this area.)
- In Buda (III. district) where textile industry constituted the leading industrial sector. Shipbuilding and agricultural machinery production were also important here.
- In the southern part of Buda (districts XI and XXII) concentrating textile production and telecommunications-electronics.

No significant industrial activity could develop *in the Budapest agglomeration* before the transition because Budapest's industry could not have survived without the labour force of the agglomeration. Labour shortage was becoming ever more acute from the middle of the 1960's, so that strict measures were introduced to control the establishment of industrial production (and other economic activities) in 44 settlements around the capital. The sparsely built-up settlements of the agglomeration retained therefore a distinct rural character with an underdeveloped infrastructure.

After 1989

The industrial development of the Budapest agglomeration after 1989 has had significant spatial consequences:

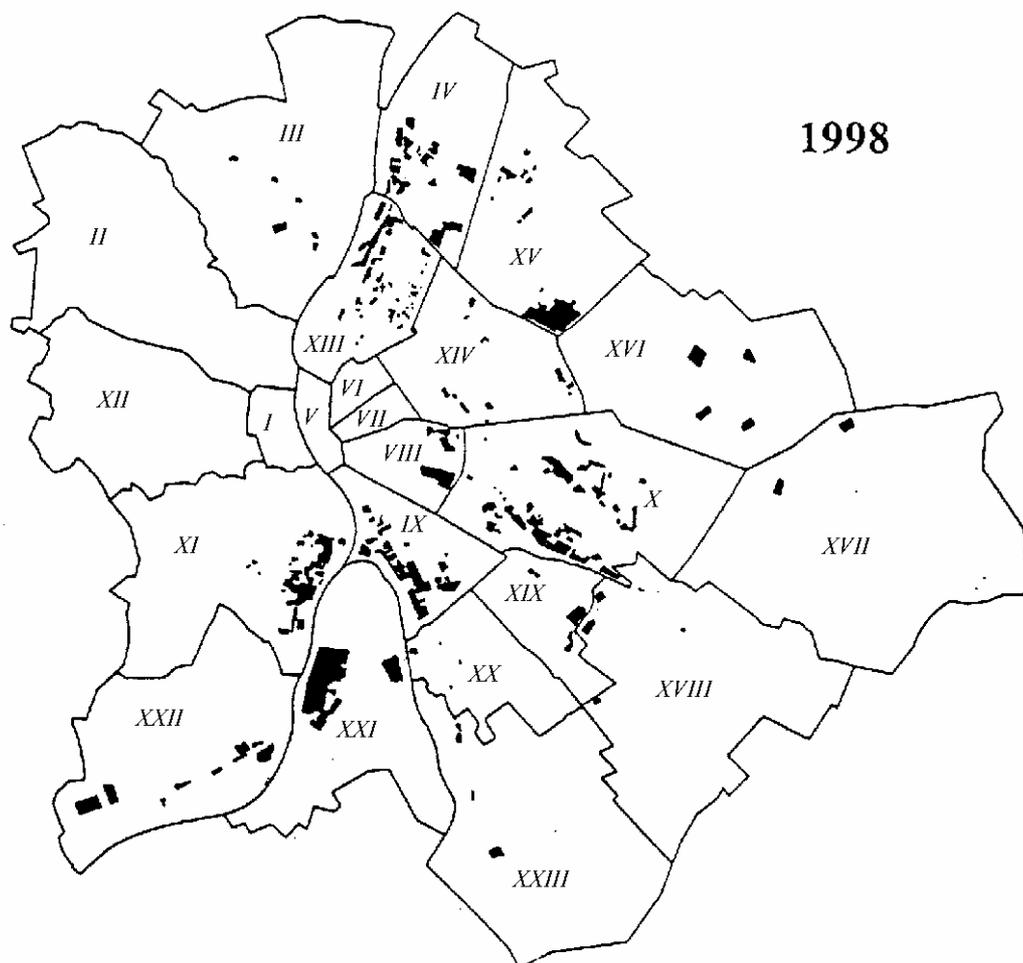
- Most spectacularly, many of Budapest's industrial areas have been vacated and are now being re-used for other purposes.
- A less important though undeniably present trend is manifested by renewed activities in traditional industrial areas in some parts of Budapest.
- Some new industrial areas have been formed, mostly as greenfield investments along the administrative boundaries of the capital.
- Due to deep structural changes in the division of labour, an important share of industrial activities has been relocated to agglomeration areas. This development is primarily to be attributed to greenfield investments, although some of the already existing industrial production has also been moved out of Budapest.

Generally speaking, it can be said that the complete termination of industrial activities and the functional restructuring of areas has been characteristic of the northern and northeastern parts of the city, whereas partial or complete renewal of industrial activities has prevailed in the southern and southeastern areas. It must be noted, however, that a new trend has also become observable in recent years. Differences in how industrial areas are being re-designated reflect less and less the former north-south divide in the city. Priorities have become rather more dependent on the distance of the given area from the centre. In other words, traditional industrial areas lying closer to the city-centre or are otherwise more accessible (transport) have been subject to a complete functional change, whereas renewal of industrial activities has been typical in peripheral areas. On the whole, this dual-way development has been mostly taking place in a so-called *transitional zone* located between densely populated inner districts and the suburban ring.

Functional changes have first started in industrial areas situated in the northern part of the city (IV. district). This area has boasted the most dynamic changes as well. The main axis of this area is the 'Váci út', on the western side of which (lying closer to the Danube) industrial enterprises have been largely replaced by tertiary activities (trade and maintenance). Nowadays, remaining parts of old industrial companies are only to be found sporadically here.

By contrast, *restructuring, renewal of industrial activities* and reconstruction of industrial plants has been characteristic *in the southern, southeastern part of the city (districts XX, XXI, XXII)*. Only enterprises that accommodated particularly space-demanding activities or were particularly hostile to the environment have had to move out from here or close down production. In all probability, however, industrial enterprises will continue to produce in these areas in the long-run as well. This prediction is supported by statistical figures: Relatively fewer industrial enterprises have ceased to exist in these areas in recent years, while new investments have continued to remain high (Fig. 2).

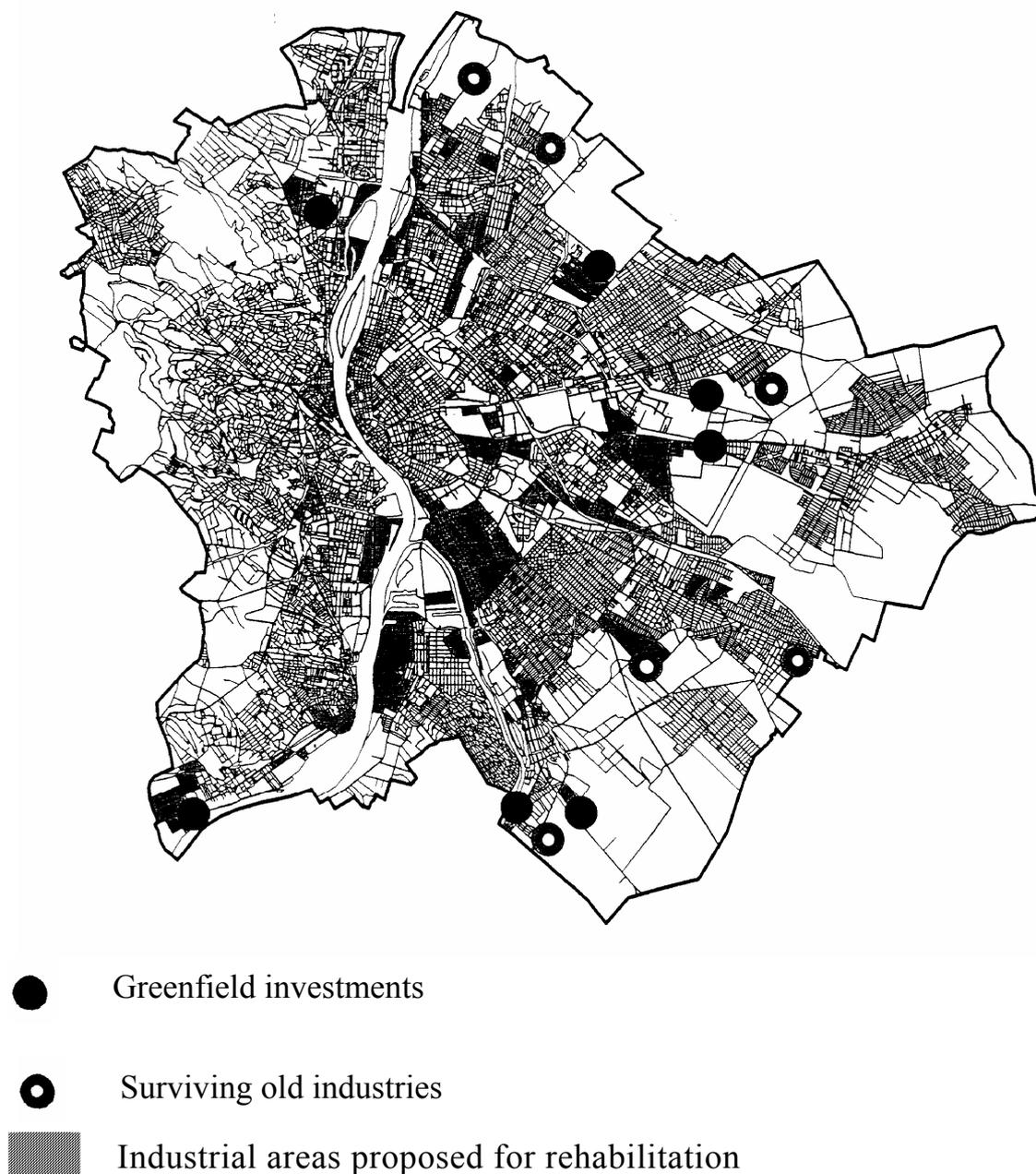
Figure 2
Present location of industry



Source: Study for OTKA (FO16238), 1998; compiled by É.Kiss, Institute of Geography, Hungarian Academy of Sciences

A new tendency in the development of the capital's spatial structure is the *emergence of an industrial ring along the city boundaries*. This is mostly due to greenfield investments that have nevertheless preferred to settle next to former industrial areas (e.g. greenfield investments in the XVIth, XVIIth and XVIIIth districts and enlargements of former industrial areas in the IIIrd, Xth and XXIIIrd districts, Fig. 3). The emergence of such zones at the city boundaries results from a spontaneous urban development process.

Figure 3
New industrial development in Budapest



Compiled by L. Koszor^o, 1999

Such greenfield investments highlight the interesting fact that Budapest still has a great number of vacant plots. It follows from this that the lack of available space cannot explain the relocation of industry into the agglomeration or even more distant regions. The real reason is to be sought rather in changes in the real estate market. The accessibility of this new industrial zone through public roads is certainly a relative advantage.

At the same time, the congestion of these roads as well as the unsatisfactory and costly rail infrastructure hinder development in this area.

The changes described above offer a bird's-eye view of the industrial structure and hardly penetrate the microenvironment of individual companies. According to a survey covering the entire capital, *on 30-35% of all industrial areas, the size of the territory occupied by industrial companies has not changed.* This finding does not exclude possible reorganisations and re-constructions on existing plants (e.g. Richter Gedeon Pharmaceuticals, Zwack Unicum Beverages, Chemical Industry Technology, Ferencváros Millworks, etc.) *At the same time, the size of the territory occupied by the majority of industrial companies has significantly decreased on approximately 65-70% of all industrial areas.* This is less to be attributed to industrial recession than to an increasingly rational siting policy pursued by industrial companies as well as to a rapid increase in real estate prices in the capital. It is not surprising therefore that there has hardly ever been an increase in the size of the terrain occupied by companies founded before 1989.

At present 4.5-5% of the capital's territory is occupied by industrial activities, still mostly in the mixed-profile transitional zone. It is no longer possible to point out industrial areas similar to those before the transition, the main reason being that traditional industrial companies have sold or leased parts of their plants not required for maintaining production. In addition, vacant industrial areas have mostly been occupied by non-industrial enterprises as well, a development which has led both to the growth of this transitional zone and its lacking a homogeneous economic profile. On the whole, the share of industrial activities has become smaller and less concentrated in this zone.

Nevertheless, the following areas still show a characteristic economic orientation in Budapest:

- *Areas preserving their original industrial use* (constituting larger connected areas in the IVth, IXth, Xth, XIth, XIIIth and XXIst districts).

- *Mixed-use areas* (industry and tertiary sector). Vacant areas formerly used by industrial companies have been occupied here by industrial, commercial and service enterprises. There is no doubt that traditional industrial areas have also seen a certain degree of *re-industrialisation*. It is still unclear what will happen in the long-run to areas leased by still existing industrial companies: whether they will cease to be used for industrial purposes or whether they will be re-occupied by the company in the course of a subsequent expansion. Leasing unprofitable areas has been an important financial means of survival for many companies. This practice may well be reconsidered now given the fact that the capital's real estate prices have grown at a very high rate in recent years.

In general, however, the tendency outlined here seems irreversible. Impressive examples abound. More than 170 different companies of various sizes share the massive production plant of the former Csepel Works. Half of the 85 buildings situated on the 32,000m² large area of the Óbuda Shipbuilding Works has been taken down, the other half houses various non-industrial activities (serving cultural, educational, sports and business purposes). A new industrial park in Újpest which accommodates approximately 20 companies has been developed at the former site of the Újpest Textile Works.

This kind of coexistence raises new problems. Conflicts are generated by the fact that unallocated public utilities and roads have to be shared among the new enterprises. Fluctuation of companies is very high in the transitional zone, change of ownership is frequent. This situation is further complicated by unregulated ownership relations which also involve many 'phantom companies'. This unregulated ownership structure is a most unwelcome fact in terms of urban planning and development because it can pose a long-term obstacle to the re-zoning of a given area.

- *Exclusively tertiary function areas* (trade and maintenance). This is the other most frequent form of land use. 15-20% of former industrial areas have been re-zoned in this way (several examples are to be found in the northern Pest area: Shopping centres and services of various sizes are now located on the premises of a former metal works, the once well-known

shipbuilding plants were taken down to make room for one of Budapest's largest shopping centres).

- Areas whose designated use was for *administrative or office functions*. The size of former industrial areas utilised in this way amounts only to a few percent. Most characteristically, buildings previously used for industrial production have been reconstructed to accommodate the new function (e.g. premises of Perion Batteries, ÉLGÉP, Rico Bandages in the XIIIth, IXth and Xth districts), although sometimes buildings have been taken down altogether to make room for new office space (e.g. International Trade Center and Duna Office on the Váci út). It must be added that despite rapid progress in the construction of new office buildings in Budapest, this function has been slow to relocate to the transitional zone and Buda.

- *Areas with residential functions*. The re-designation of former industrial areas for such purposes has been fairly untypical. This is primarily to be attributed to the fact that industrial areas are usually polluted, geographically and socially unattractive. Attempts in the IXth and XIIIth districts to construct homes in place of former industrial premises have not been unequivocally successful. (The construction of 451 homes in the Gömb utca was abandoned, for instance. On the other hand, the newly built residential park in the IXth district has proven to be one of the most successful examples of urban reconstruction in Budapest.)

It is to be noted that real estate prices have been increasing rapidly in the last two years, especially in more attractive areas (i.e. Buda, downtown Pest, XIIIth district, etc). Even flats in better housing estates have become more valuable.

- *Other functions*. Such areas are scattered at various places in the city. Their limited size makes their refunctioning difficult. This group also includes areas used temporarily for storage and parking. There are several industrial areas where production buildings have already been taken down but no new use has been assigned to the area yet. In some cases ruins of the abandoned buildings still exist (e.g. some buildings of the Csepel Works, Csepel Bread Factory, Soroksár Textile Works).

Industry in the Budapest agglomeration

The capital's outstandingly dynamic development has positively influenced the agglomeration as well. As much as one-third of all investments in Hungary have been realised in Budapest. The agglomeration on the other hand profited from 80% of enterprises in Pest county. In addition to shipping, postal services and telecommunications, industrial sectors have attracted the largest amount of investments.

These investments have been chiefly responsible for the acceleration of the agglomeration development. The most important aspect of this development is the *strengthening of local economies*. In the course of a general urbanisation, various political and economic institutions of local government have been established. The majority of commuters have now become entrepreneurs themselves in the local service industries as well as construction and small-scale industrial companies. Such enterprises now generate demand for each other's products and services as well.

The output of the local economy is not limited, however, to satisfying the needs of the local population and small-scale enterprises. *The Budapest agglomeration has been attractive for major investments as well*. There is an abundant supply of a cheap, skilled, versatile work force, enough space, a relatively advanced infrastructure as well as low taxation. In addition, Budapest's vicinity generates further demand and makes various joint-ventures possible. The agglomeration is in many respects better suited for greenfield investments than the capital's administrative area. This explains why the interest of foreign direct investments has remained constant here in recent years. It can be concluded, therefore, that the launching of new enterprises has been the characteristic trend and *not* the relocation of companies from Budapest. As has already been mentioned, a considerable share of the work force employed here is recruited from the ranks of former commuters which in turn allows for a steady employment of skilled labour and maintaining previously established economic connections.

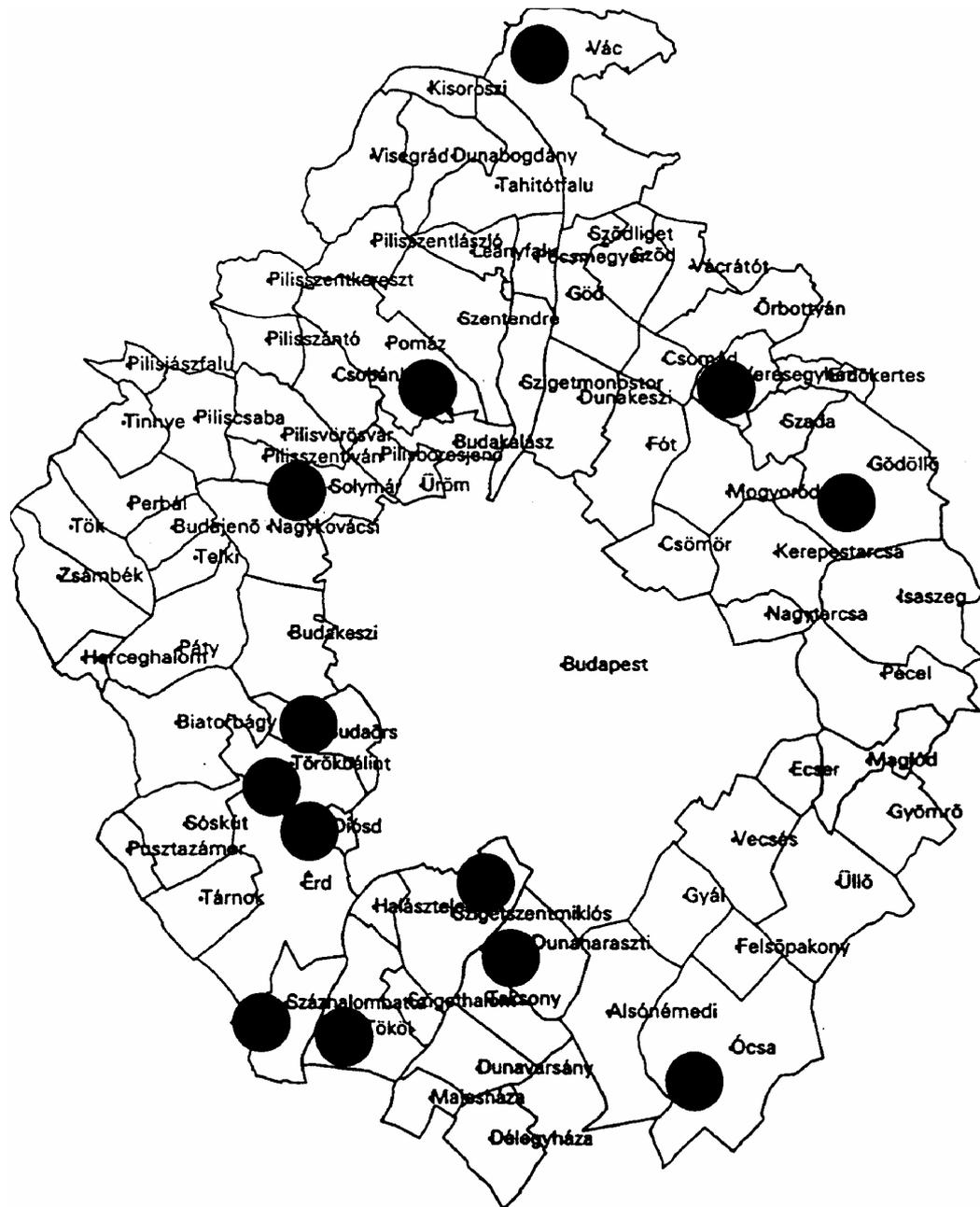
In the last decade, greenfield investments have accounted for 20-25% of foreign direct investment nation-wide. The most attractive region has

been the northwest part of the country (Northern Transdanubia). 65-70% of greenfield investments have targetted this region. At the same time, many foreign investors, including several multinationals, have opted for the proximity of the capital (e.g. Tchibo, Tetra Pack, Coca-Cola, Sony, settling, especially since 1997, in various towns of the agglomeration, such as Budaörs, Dunaharaszti, Gödöllő). Pest county and Budapest had benefited from 18-20% of such investments by the end of 1997. The machine industry has claimed two-thirds of all industrial investments, thus occupying the first place followed by the chemical and food industries.

The economic potential of the Budapest agglomeration is becoming increasingly stronger. This region can hardly be regarded as homogeneous, however, as spatial discrepancies are significant. Most importantly, the same east-west divide can be observed in the agglomeration as in the capital or in the country as a whole. The distance from the capital is another measure of differentiation, i.e. the farther away from Budapest, the smaller the economic output.

Smaller towns are becoming important local centres within the agglomeration itself. Half of all agglomeration enterprises are located in Érd, Budaörs, Dunakeszi and Gödöllő, four-fifth of the agglomeration industrial work force is employed in Gödöllő, Vác, Százhalombatta, Budaörs and Szigetszentmiklós. The greatest technological capital is concentrated in Százhalombatta at the Duna Powerstation and the Mol Oil Company (Fig. 4).

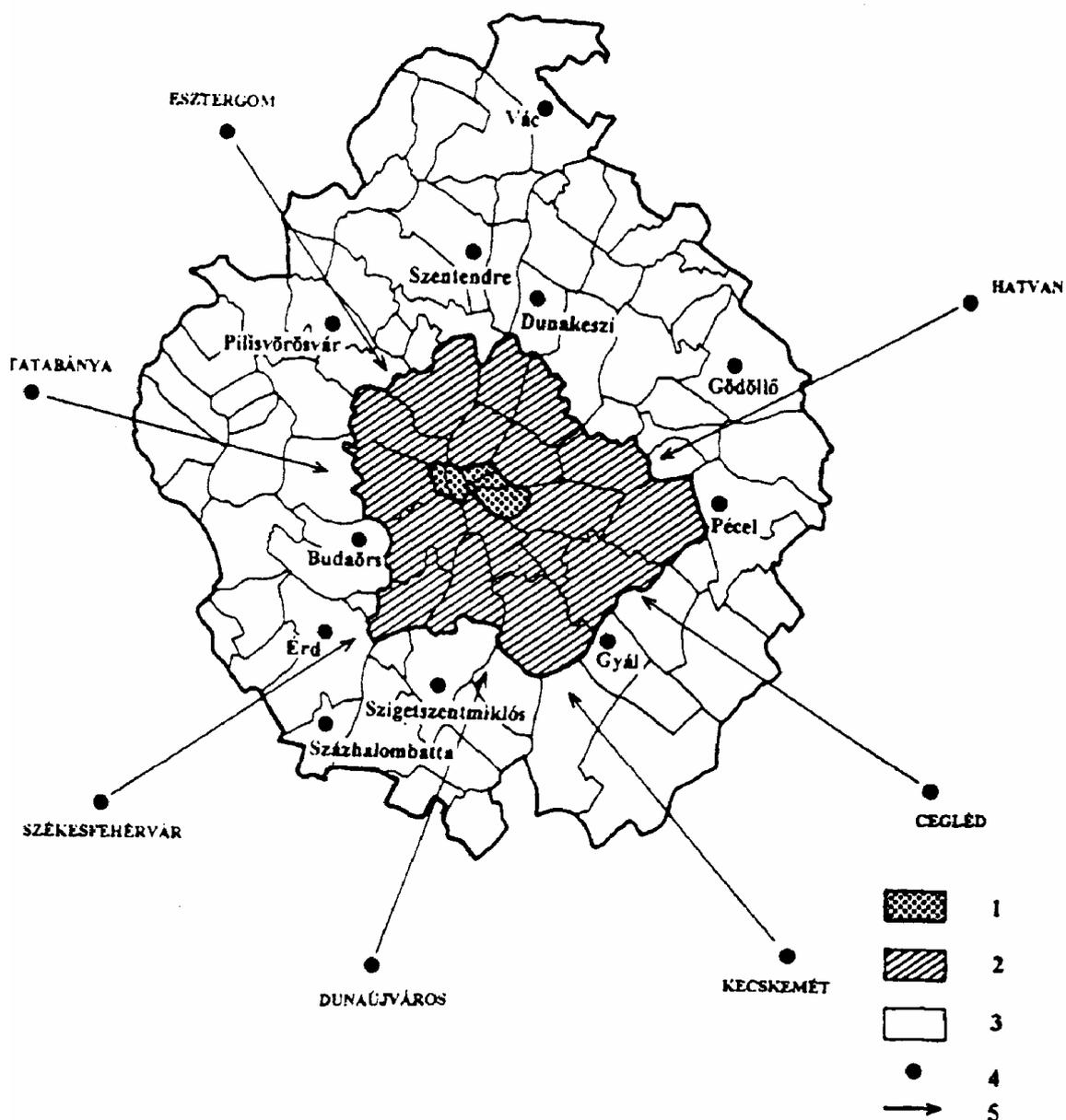
Figure 4
Towns of the Budapest agglomeration with important industry



The agglomeration has by now considerably ‘outgrown’ its official boundaries. The intensification of economic relations indicates an increasingly strong connection between the agglomeration and the northwestern region of Transdanubia. The emergence of a number of rings in terms of economic prosperity can also be observed, i.e. the ring of

small agglomeration towns is surrounded by a 60-70 kilometres wide ring of larger towns such as Székesfehérvár, Tatabánya, Esztergom, Hatvan, Kecskemét, Cegléd and Dunaújváros (Fig. 5).

Figure 5
Ring of towns around Budapest



1 = City
2 = Suburban districts
3 = Direct agglomeration belt
4 = towns
5 = Ring of towns around the Budapest agglomeration
Compiled by É. Perger, 1999

2.1.3. Capital/foreign direct investment

Investments in Budapest's industry

Investments in Budapest's industry exceeded the average growth of all economic sectors until 1995, started to fall in 1996 and then increased again in 1997. Investments of companies increased until 1994, the recession of the next two years was once again followed by renewed growth (Bartha, 1998). The fluctuation in investment figures is to be attributed to some economic destabilisation, severe austerity measures, high inflation and a shortage of capital.

It is important to note, however, that only 17-18% of domestic industrial investment went into Budapest's industry in 1996. This figure is significantly less than the capital's overall share of investments in the national economy (36%) and also less than the share of Budapest's industrial production of the national industrial output (26%). These figures signify a nation-wide restructuring of industry, i.e. a decreasing share of Budapest's industry, and by the same token the decreasing importance of industry *within* Budapest's dynamically expanding economy.

Foreign direct investment has contributed very significantly to new investments after the transition. As much as 50-60% of foreign direct investment has been concentrated in Budapest. This implies that a growing part of investments in the capital originates from foreign sources (25% in 1992 as opposed to more than 50% in 1997). Especially American investors have been found to prefer the capital (almost three-fourths of American foreign direct investment has been channelled into Budapest's economy) followed by Austrian and German investors.

The proportional share of foreign direct investment that has been attracted by manufacturing was much higher than the share of domestic investments directed at the same sector. This has also been the case in Budapest's industry. In 1996, 31% of all foreign direct investment was taken up by Budapest's industry, foreign direct investment amounted to 53% of capital registered here. Nevertheless, this figure was already a

mark of a significant and continuous decrease, since in 1991 more than 50% of foreign direct investment in Budapest had been invested in the capital's industry. Industrial investments have not become less attractive, but at the same time the prospects of investments in other sectors have improved. (In the early 1990s, privatisation had generated a favourable environment for industrial investments, whereas the real estate, banking and insurance markets were opened up to investors only some time later. In addition, Budapest is obviously less advantageous for launching greenfield investments than the countryside.

The average (registered) capital of Budapest-based companies exceeded the average capital of companies not based in the capital over all economic sectors. Manufacturing companies seated in Budapest registered on average 19% more capital in 1996 than their counterparts in the countryside in the same year. 45% of foreign direct investment in manufacturing was invested into Budapest-based companies. The intensity of investments, i.e. the volume of investments per enterprise, has also been typically much higher in Budapest than elsewhere. Such concentrated investments indicate a longer-term investment policy in the capital (Hamar, 1998).

Investment in the agglomeration

Approximately 40% of all investments were concentrated in the area of the Budapest agglomeration (i.e. Budapest plus agglomeration) in 1996, 35-36% of which were directly targeted on the capital. A higher share of investments into (imported) modern, state-of-the-art machinery and equipment (and not into buildings or infrastructure) than the national average was registered in the agglomeration. This explains why the area of the Budapest agglomeration has been steadily posting better efficiency rates than the rest of the domestic economy.

A significant difference can be observed between the agglomeration and the capital in terms of the sectorial structure of investments. As much as 75% of investments have been absorbed by the tertiary sector in the capital, only 20% by the local industry and 5% by the construction sector

(shipping, postal services and telecommunications have been the main areas of investment in the tertiary sector). By contrast, in the agglomeration almost 50% of investments have gone into industry. This difference underscores the changing division of labour within the Budapest agglomeration area which involves first of all the increasing weight of industrial production in the agglomeration itself. It can also be concluded that the positive influence of the capital's economic prosperity does not lead to the emergence of a homogeneous economic structure. In other words, the economy of the agglomeration zone is likely to remain characteristically different from the structure of the capital's economy.

Foreign direct investments have played a decisive role in the agglomeration as well. Foreign investors have tended to prefer manufacturing, the real estate sector and trade here. In five out of the six significant economic sectors of the agglomeration, foreign interest in joint-venture companies exceeded 50% already in 1997.

2.1.4. Education - innovation - economic growth

According to some theory, education, innovation and economic growth are strongly correlated, or they can be seen rather more like a one-directional chain reaction: The pre-condition of innovations is a high level of education, and the motor of economic development is innovation (Stevens, 1996).

In the transitional period of Hungary, this cause-effect relationship has been loosening, or was even broken in some instances. Nowadays an important part of the resources required for economic growth comes from abroad (investment capital, know-how, licenses, and even a part of the skilled labour dealing with the imported technology). The domestic innovations have concentrated mainly on finding methods of how to survive or adjust to the changing economic system, the market economy. At present the economy is generally quite uninterested in the results of domestic R&D. (Between 1990 and 1996, for example, the number of patents registered in Hungary decreased from 647 to 170, and from 1158 to 176 registered abroad. OMFB, 1997). Job qualification has become a

selective advantage (or devaluated), as in the present stage of economic development the requirements concerning education have changed drastically. Funding of research and development and education depends on economic growth, but the economic prospects are not promising enough to support the Hungarian knowledge base more generously than was the case before the system change (Döry-Mészáros-Rechnitzer, 1998).

Table 7
Research and development in Hungary

	1989	1993	1997	1997/89 (%)
Number of R&D institutes	1312	1380	1680	128
Number of researchers	36 384	23 012	18 349	50
Total expenditure on R&D in relation to GDP (%)	1.96	1.0	0.76	39

Source: Engloner, Gy. 1998; OMFB, 1997

It can be seen that the number of researchers has been halved, the total amount spent on R&D decreased by 60% (in real terms it hardly reached 20% of the sum spent on R&D in Hungary in 1989). In 1997 the number of researchers as a portion of the active population was 40% less in Hungary than the EU average (Table 7).

As far as R&D activity is concerned, *the situation of Budapest is more favourable than that of the national average*, but it is obvious, that the negative tendencies are noticeable in the capital as well. There are several reasons why the decrease in R&D in Budapest was much less pronounced than in the countryside:

- The Budapest population exhibits a much more entrepreneurial mentality than one would find in other parts of the country. About 40-45% of all Hungarian enterprises have concentrated in the capital after the change of the political system.

- Adjusting to the new economic situation came easier to the Budapest enterprises during the economic restructuring, they met the requirements of the market more quickly, than those in the countryside.
- The relatively bigger capital investments, particularly that of foreign investors, assisted in the more dynamic modernisation of the local economy in Budapest.
- The continuing attractiveness of the local economy has stimulated its permanent structural renewal.
- The knowledge base, i.e. education and R&D, has traditionally had its centre in Budapest (Table 8).

Table 8
R&D in Budapest, 1997

	<i>Budapest</i>	<i>Total</i>
Number of research institutes	735	1679
Budapest-based (%)	43.8	100.0
Number of employees in R&D	21 166	39 626
Working in Budapest (%)	53.4	100.0
Researchers (%)	56.8	100.0
Expenditure on R&D (in million HUF)	36 584	57 184
In Budapest (%)	64.0	100.0
Number of research institutes per 10000 inhabitants	3.9	1.7
Number of researchers per 10000 inhabitants	67.2	21.7
Total expenditure on R&D per 10000 inhabitants	195.2	56.3

Source: Közép-Magyarország (Middle Hungary). Regions in Hungary, I. KSH, 1998

As Table 8 shows, between half and two-thirds of Hungarian R&D is concentrated in Budapest. (The R&D institutes belonging to universities are located geographically more evenly throughout the country than the inde-

pendent R&D institutes). The higher significance of a knowledge base is a privilege of any core region and big cities in general, as is the case of Budapest as well. This contributes to a potential dynamism of social-economic development and enhances the capabilities for renewal.

In spite of the general tendencies described above, the decreasing R&D capacity, the low level of technological innovation, the impoverishment and deterioration of higher education, the backwardness of the infrastructure in the knowledge industry, and the decreasing living standard of researchers and teachers characterise the knowledge base in Budapest as well. But these negative tendencies have been less dramatic in the capital than in the rest of the country. In addition, foreign investors, particularly the multinational companies, are beginning to discover Budapest as a potential location of their own R&D. During the past few years new R&D centres have been founded in Budapest (GE, IBM, Ericsson, Knorr-Bremse, Chinoi-Sanofi, Phylaxia-Sanofi, Nokia, etc.; Várnegi, 1998). *There is no doubt that Budapest will continue to maintain the largest concentration of R&D in Hungary.*

2.2. Structural changes

2.2.1. Recession and restarting in the industrial production

Table 9

Industrial production (1)

(index of volume, the previous year=100)

	<i>1991</i>	<i>1993</i>	<i>1995</i>	<i>1996</i>	<i>1997</i>	<i>1998 (2)</i>
Budapest	80.5	98.4	100.0	101.1	105.6	105.1
Total	81.6	102.4	104.4	103.6	111.1	113.8

(1) in enterprises employing more than 50 persons

(2) first half of the year

Source: Budapest Statisztikai Évkönyve 1996, Statisztikai Zsebkönyve, 1997, Budapest Statisztikai Tájékoztató 1998/2, Magyar Statisztikai Évkönyv 1996, KSH Statisztikai Havi Közlemények 1998/6. KSH, Budapest

The amplitude - both in recession and growth - was more limited in the industry of Budapest than in the countryside. The production in the industry began to increase two years later in Budapest, practically after 1995, than in the other regions in Hungary (Table 9). *All together, it is obvious, that from 1995 the industrial production is continuously increasing even in Budapest, as well* (Barta, 1999).

2.2.2. Changing industrial structure

Industry in the economy of Budapest

It is not surprising that the number of those employed in the industrial and construction sectors has been decreasing. On the other hand, it is worth taking into account that similar trends have dominated trade and tourism as well. Moreover, the size of Budapest's active population has also continued to decrease. The industrial labour force decreased by 44% and the construction labour force by 56% between 1992 and 1997, whereas the number of those employed in trade declined by 43% and the active working population shrank by 26% during the same period.

The number of civil servants and government officials remained more or less constant. Almost one quarter of Budapest's active population was employed in various parts of the public administration (Table 10)

Table 10

Changing employment structure in Budapest (%)

<i>Sector</i>	<i>1992</i>	<i>1994</i>	<i>1996</i>	<i>1997</i>
Manufacturing	20.5	16.6	15.2	14.8
Industry	22.3	18.8	17.4	16.9
Construction	5.2	4.1	3.4	3.1
Trade and tourism	13.6	10.5	11.2	11.2
Transport. telecom.	10.3	11.0	11.5	11.0
Finances	2.7	3.5	3.7	4.0
Real estate. insurance	7.3	5.9	6.7	7.0
Public administration	17.3	22.7	21.8	23.2

Education	7.3	8.9	9.1	8.2
Health	9.1	9.3	10.2	10.6
Other	4.9	5.3	5.0	4.8
Total	100.0	100.0	100.0	100.0

Source: Budapest Statisztikai Évkönyvei, 1992,1994, 1996, 1997, KSH, Budapest

Among the enterprises trade and real estate sectors are dominating (more than 60%), in the structure of investments, particularly in foreign direct investments the industry, construction, transport and telecommunication are the decisive elements (60-75%). It is interesting, that the decrease in the employment was the most intensive in the latter mentioned sectors (which means, that one reason of the diminishing employment was the drastic increase in productivity). (Table 11, cf. table 1)

Table 11

Sectoral structure of Budapest's economy, 1996, (%)

Sectors	Enterprises (1)	Investment	FDI	GDP (2)
Agriculture	0.8	0.2	0.0	0.5
Industry	12.2	19.9	24.0	18.3
Construction	7.3	10.1	16.9	4.3
Trade	29.8	9.3	10.6	n.a.
Tourism	3.1	1.6	2.0	n.a.
Transport/Telecom.	6.2	30.5	34.0	n.a.
Finance	0.4	7.0	9.6	n.a.
Real estate sector	31.1	7.1	2.8	n.a.
Public administ.	0.0	4.0	0.0	n.a.
Education	0.6	3.4	0.0	n.a.
Health service	1.3	2.7	0.0	n.a.
Other	7.2	4.2	0.1	n.a.
Total	100.0	100.0	100.0	100.0

(1) Active enterprises, (2) 1995

Source: Budapesti Statisztikai Évkönyv, 1996, 1997

The size structure of Budapest's enterprises is determined basically by the national economic changes. In the first years of the transitional period the

larger proportion of small enterprises was a characteristic compared with the size structure of the national economy, due to the quicker transformation (from the central planned economy to the market economy) in the economy of Budapest, than in countryside. Later, the regional differences in size structure have become equal. (Table 12; Barta, Beluszky, 1999)

Table 12

Changing size structure of enterprises (%)

<i>Categories (persons)</i>	<i>1991</i>		<i>1993</i>		<i>1996</i>	
	<i>(1)</i>		<i>(1)</i>		<i>(2)</i>	
	Bp	Total	Bp	Total	Bp	Total
-20	79.0	72.5	87.1	81.7	93.1	89.0
21-50	11.7	12.2	7.4	9.1	4.0	5.9
51-300	6.6	10.6	4.2	7.2	2.3	4.2
301-	2.7	4.7	1.3	2.0	0.6	0.9
Total	100.0	100.0	100.0	100.0	100.0	100.0

(1)Economic enterprises with legal entity, (2) Active economic enterprises with legal entity

Source: Magyar Statisztikai Évkönyvek, Budapesti Statisztikai Évkönyvek, KSH, Budapest

The economic enterprise structure is continuously breaking up into smaller parts., This means the decrease of the medium and big enterprises, and the increase of small enterprises. At the same time the beginnings of an organisational concentration can be recognised in the category of small enterprises at the expense of the micro-size enterprises (less than 10 persons). Nevertheless, the Hungarian organisational structure by size doesn't differ essentially from that of the EU countries. In Hungary the proportion of the micro-size enterprises is higher, and that of the bigger size (10-49 employees) enterprises is smaller, than in the EU. It may be added that even the micro-size category may be more limited in Hungary, too, but a few activities (for example, to offer a flat for rent, to be an agent, etc.) can be done legally, or more advantageously from a taxation point of view, only in the framework of an enterprises (Table 13).

Table 13

Enterprise size structure in the EU, Hungary and Budapest, 1996 (%)

<i>Size</i>	<i>EU</i>	<i>Hungary</i>	<i>Budapest</i>
Micro	92.5	96.5	96.3
Small	6.3	1.5	1.7
Together	98.8	98.0	98.0
Medium	1.0	1.8	1.8
Big	0.2	0.2	0.2
Total	100.0	100.0	100.0

Source: Observatory (1996) p. 49 In: Román, Z., 1998, Peterdy, V., 1998,p.9, Budapest Statisztikai Évkönyv, 1996

Industrial structure in Budapest

In the structure of Budapest's industrial production, first of all the machinery sector, and, to some small extent, the food industry and metallurgy have increased, while that of the textile, wood, paper, printing industry and the chemistry have declined.

All together three branches create around 70% of the industrial production of Budapest: food industry, machinery, and first of all, chemistry.

The main difference in the branch-structure of the industry between Budapest and Hungary as a whole is the distinguished role of chemistry in the capital's industry (Table 14).

The share of manufacturing in the national industry - except of the food industry - is decreasing both in production volume and export. But, it has to be emphasised that in 1997 about 50% of the national production and export of the chemistry industry and 25-30% of the wood, paper and printing industries came from Budapest's industry. In the national industrial production, about 20%-30%, and in the national industrial export 15-25% were the contributions of Budapest's food, textile and machinery industries

Table 14
Changing structure in the production and employment of industry (%)

<i>Sector</i>	<i>Production</i>			<i>Employment</i>	
	Budapest	Budapest	Total	Budapest	Budapest
	1993	1997	1997	1993	1996
Manufacturing	87.3	87.4	87.2	90.1	87.3
-Food ind.	12.6	14.1	18.8	10.6	9.1
-Textile	4.5	2.9	3.9	10.8	8.5
-Paper, printing	7.4	6.0	5.1	11.2	10.9
-Metallurgy	4.3	4.4	8.7	9.1	9.3
-Machinery	19.0	22.7	29.3	29.2	26.2
-Chemistry	36.6	35.2	17.5	13.8	18.0
Total	100.0	100.0	100.0	100.0	100.0

Source: Budapest Statisztikai Zsebkönyve 1993, 1997, Budapesti Statisztikai Tájékoztató 1998/2, KSH Statisztikai Évkönyvek

3. Future development of the industry

3.1. Economic concentration and central functions

- *In the long run, the Budapest agglomeration is going to remain the most important economic concentration of the country and one of the most important in Central Europe.*

The Budapest agglomeration provides 900-950 000 jobs at present. Forecasts predict that in the coming decade this job market will expand further, even in absolute terms. This will amount to a 5-10% increase in the number of those employed in Budapest. An even more intensive growth, about 10-15%, can be expected in the agglomeration itself. The increase in the number of white-collar and academic jobs is likely to exceed the average increase of employment rates (i.e. an increase of approximately 20% is expected in these areas; M. Z. Petchnig, 1997; T. Matolcsy, 1998; Regional Development Masterplan of the Budapest Agglomeration Development Council [BAFT], 1999).

In other words, demand for labour will increase while population figures will continue to fall in Budapest and stagnate in the agglomeration. This implies that *the Budapest agglomeration is going to recruit more and more members of its labour force from surrounding regions*. The higher economic performance of this region can be expected to lead to increasing migration and commuting as well as a growing presence of foreign labour.

As in the case of Western European metropolises, Budapest is going to see *the emergence of a split labour market*. Demand for highly-qualified labour will increase on the one hand, and so will the need for unqualified labour performing various (frequently illegal) personal services, on the other. This dual labour market can be expected to prevail primarily in sectors dominated by foreign investors.

- *The economy of the Budapest agglomeration has been hitherto subject to an extremely rapid modernisation process. This tendency is likely to continue, though probably at a somewhat slower pace than before.*

Recent years have seen a significant shift in the division of labour between manufacturing and services sectors in Budapest — from a 40%-60% division to a present 20%-80% in favour of services. The share of manufacturing is certainly going to remain higher in the agglomeration belt than in the capital. Receding agricultural activities and extending services will also lead, however, to a shift in favour of the tertiary sector in the agglomeration. Material services (trade and finances as well as high-value-adding, top-end business services) are going to be primarily responsible for growth in the tertiary sector both in Budapest and the agglomeration.

A tightly-knit network of economic connections will develop between economic sectors and companies. Subcontracting small and medium-sized enterprises associated with various large companies are going to emerge. The division of labour between Budapest and the agglomeration will take on a definite shape with characteristic sectorial differences. On the whole, the distance between place of residence and place of work will increase (but the difference between the number of people commuting into the city and out of the city will be smaller than in previous years). The division of labour between company headquarters and manufacturing plants is likely to remain unchanged (headquarters mostly remaining in Budapest).

The emergence of new industrial zones can be predicted. They will develop according to a complex system of vertical and horizontal divisions of labour. These divisions of labour will primarily affect, among others, the nature of relations between large and multinational companies and their subcontractors in the food and chemical industries and between co-operating small and medium-sized enterprises in the paper and printing industries.

- *Budapest will assume the increasingly important role of a knowledge base*

Knowledge represented as human capital, i.e. as a human resource and technology, is going to play a key role in sustaining future economic growth. The high concentration of scientific-academic knowledge and technological know-how can foster the development of the Budapest agglomeration in important ways, as leading sectors of the knowledge-industry are going to stimulate growth in other areas as well. Such leading sectors include higher education, special training for highly specific economic needs, the concentration of research centres and the information-technology industry as well as the entire infrastructure serving these activities (technological parks, advanced telecommunications technologies, top-end business services, etc).

Knowledge-base concentration in the capital is hardly a recent development, although it must be said that the last decade has seen a considerable evening-out of spatial discrepancies in this field (the percentage of academic staff and students at the capital's higher educational institutions now corresponds approximately to Budapest's share in the national population). New higher educational institutions have been founded in the Budapest agglomeration (including the newly founded Catholic University at Piliscsaba) and already existing colleges and universities located in various towns of the 60-70km wide belt around Budapest have become more active (for instance, the Agricultural College of Gödöllő which has been developed into a national educational institution).

The lack of close connections between the various institutions of the capital's knowledge base is certainly the greatest obstacle at present. This explains why synergies between these institutions still cannot be realised sufficiently. Unsatisfactory co-operation is no doubt to a great extent to be attributed to a number of historical, financial and organisational reasons. The key reason, however, is certainly the lack of demand on behalf of new enterprises, including Budapest-based investments of multinational companies, for a highly-qualified knowledge base. Progress made in this area thus far has been small. The Budapest INFOPARK is in fact the first Hungarian technological park based on a co-operation of

high-technology multinational companies and universities (Kovács, 1998).

- *Economic growth must be generated by the sustained performance of investment activities*

There is no reason to expect foreign direct investment to lose interest in Budapest with the end of the privatisation process. On the contrary, current tendencies provide ample evidence of already existing enterprises attracting new investments. Foreign ownership has been growing in joint-ventures. New investments contribute to the modernisation and growth of companies already in full foreign ownership. It can be concluded therefore that Budapest's outstanding potential for attracting capital has not decreased in the last ten years. For instance, in the telecommunications, information-technology and software sectors investors continue to show a distinct preference for Budapest. Such multinationals as IBM and Nokia have already started establishing their own R&D centres in the capital. A diverse labour market offering a highly-skilled and relatively cheap labour force is going to remain a long-term incentive. Surveys unanimously predict that large-scale investments of Budapest-based companies are invariably going to exceed national figures between 1998 and 2002 (73% of the largest exporting companies located in Budapest plan to make investments of over 500m HUF by 2002, whereas the same figure is only 40% nation-wide).

The agglomeration zone on the other hand is better suited for greenfield investments (including shopping centres, discount stores, offices, warehouses, logistical bases in the commercial and real estate sectors and the construction of new hotels in the tourism industry). The attention of foreign investors is likely to extend towards less frequented areas of the agglomeration as well. Governmental investments have primarily focused on the agglomeration belt (plans already approved of include the completion of the M0-motorway ring around the capital and the construction of a new sewage-treatment plant). It is also expected that the development and investment activities of domestic and foreign investors will become more diversified. Finally, further EU funds will probably

become accessible in the course of Hungary's access to the European Union (Fazakas, Deák, 1998)

The future growth of the economy of the Budapest agglomeration will in all likelihood exceed the national average. First, it is to note that foreign direct investments concentrated in Budapest are generally more productive than domestic enterprises. Second, the structural transformation of the economy of the Budapest agglomeration is going to stimulate a more dynamic economic growth. As already mentioned, this transformation leads to a shift in favour of market services in Budapest. Precisely this sector, which has at present already a 60% share in the capital's economy, is predicted to achieve a growth rate above that of the GDP.

- *Economic concentration, a significant knowledge base and dynamic investments will lead to the emergence of a complex and characteristically-structured local economy. They are also going to result in the strengthening of the central economic functions of the capital.*

The Budapest agglomeration will continue to play a central role in *exports* as well as in the *domestic wholesale and retail* trade. The capital's central trading functions will also be extended to the agglomeration belt due to the construction of shopping centres and department-store chains and the enhancement of logistical functions. Retail businesses of the agglomeration are going to continue to attract shopping tourism from surrounding countries in the next few years as motorway construction projects are being realised. The process of capital concentration will probably continue in this sector, further mergers are expected (especially in the food retail sector, e.g. the acquisition of the Julius Meinl delicatessen chain by Belgian Profi). Chains are going to become prevalent, the market share of small retail shops and family enterprises will fall even in smaller settlements.

The development of the *financial sector* is going to continue. At the same time, its spatial concentration will remain strong. In other words, *Budapest is going to stay the exclusive centre of financial services*. This involves the concentration and centralisation of banks and insurance

companies. Meanwhile, their services will become more accessible and regionally distributed as branches and outlets will become more numerous, perhaps also using existing channels such as post offices.

Budapest is the exclusive centre of the Hungarian administration. At present, every fourth active member of the capital's population is employed in the civil service. Their numbers are not going to increase with the growth of the labour market. Nevertheless, despite a slightly smaller share, the State administration will continue to play a decisive role in Budapest's economy and labour market.

Manufacturing will be increasingly relocated from the capital to the agglomeration ring (and the countryside). *However, Budapest's industry will remain the largest industrial concentration in the country.* On the whole, it can be said that the capital's industry has been subject to a thorough transformation in terms of sectorial, employment, ownership, regional and company-size structures. Its technological standards will increase radically, productivity, efficiency and profitability figures significantly exceeding the national average.

The capital's once prosperous *tourism sector* has been experiencing a fairly deep recession in recent years, despite some continuing success in congress tourism which keeps attracting foreign organisers. The agglomeration ring itself has never attracted any large number of tourists. The fact that much-needed investments have not been realised in this sector is not only to be attributed to capital shortage. Both the central administration and local governments have failed to recognise the potential inherent in the tourism industry. Private investment has also remained insufficient. International trends indicate, however, important changes in this sector. The role of culturally diverse metropolises has once again become more significant. In other words, the present development of international demand in tourism and the distinctive attractions of the Hungarian capital could promisingly converge in the future.

Agriculture is going to be pushed back to a more and more marginal function in the Budapest agglomeration. The acreage of land used for

agricultural purposes has been steadily decreasing. Only in the southern sector of the agglomeration will agriculture remain an important factor (this is a traditional agricultural area). Forest plantations and re-grassing take up the largest areas among planned conversions of land formerly used for agricultural purposes. These developments are important to reduce devaluation damages and are necessary to make Hungary's agriculture EU-compatible. In addition, they help to close the green belt around the capital.

3.2. Future industrial changes

In the 1990s, industrial development has been based mostly on foreign direct investment, particularly on the investments of multinational companies. This development has been highly dynamic, though not free of conflicts. The main reason for these tensions is to be sought in the fact that foreign investments could not sufficiently integrate domestic industrial potential, or conversely, that domestic industry has been incapable of co-operating with foreign enterprises. Products that could not be obtained at the domestic market had to be imported which in turn resulted in dangerous budget and balance of trade deficits. In addition, the entire industry has basically been split into two separate divisions: foreign companies versus those in domestic ownership, export-oriented foreign enterprises versus those producing for the domestic market, an export-oriented machinery industry versus sectors producing non-exportable goods, dynamic industrial regions versus those suffering the repercussions of industrial recession (Schweitzer, I., 1998).

The optimistic scenario concerning the future of the Hungarian economy assumes above-average industrial growth which in turn depends on steady export performance, growing domestic consumption, integration of the industries in foreign and domestic ownership. According to this scenario, the industry of the Budapest agglomeration will be characterised by growth and structural transformation in the following 4-5 years.

- *Growing production*

The growth of Budapest's industry will be more or less equal to the growth of the national GDP. This implies a 4-5% yearly growth rate in the medium-run for industrial sectors in the capital. This will be much less than the overall rate of domestic industrial growth (about 10-12%). At the same time, according to this prediction, industrial sectors will maintain or even improve their positions within Budapest's economy.

- *Transformation of sectorial structure*

A faster growth of certain industrial sectors can be expected in Budapest (in particular in telecommunications, electronics, information technology, paper-manufacturing, printing and pharmaceuticals). In this respect Budapest will prove no exception to general forecasts for the domestic economy, although expansion of these industrial sectors in the capital will fall short of the national average. Industrial growth figures are going to be improved by industrial investments in the agglomeration ring (Table 15):

Table 15

*Medium-term forecast for Budapest's industry, 1999-2002
(production volume, previous year = 100)*

<i>Sector</i>	<i>1999</i>	<i>2000</i>	<i>2001</i>	<i>2002</i>
Industry (total)	105	105	104	105
Food	102	103	100	103
Textile, clothing	98	100	96	100
Paper, print- ing	105	105	102	108
Chemical	100	102	100	102
Metallurgy	100	100	100	100
Machine	112	110	105	110
Electricity	105	105	104	105
Industry:				

- domestic market	107	107	101	104
- exports	110	110	110	110

Source: I. Schweitzer: Medium-run forecast for Budapest's industry (1998-2002). Budapest: Kopint-Datorg Rt. 1998, p. 65.

The expected above-average growth of the construction industry is also to be noted. This will amount to a yearly growth of 10-12% in Budapest.

- *Transformation of company size-structure*

Further capital concentration is expected in the energy sector and the food industry.

The optimistic scenario expects a rapid development of domestic small and medium-sized enterprises. Despite considerable fluctuation, the overall number of new enterprises launched will multiply rapidly. Small and medium-sized enterprises will be increasingly able to become subcontractors of foreign multinationals (especially in the chemical, food and machinery industries). On the other hand, the co-operation of small and medium-sized enterprises in the wood, paper and printing industries as well as in the machine industry will create new industrial districts in the Budapest agglomeration.

- *Employment forecasts in the industrial sector*

It follows from the foreseeable decrease of Budapest's population and the corresponding stagnation of the population in the agglomeration that the active population of the Budapest agglomeration will diminish. Economic prosperity will lead on the other hand to growing demand on the labour market. Thus commuting and the influx of legal and illegal foreign labour will both become more significant. At the same time, because of increases in productivity, labour demand in the industrial sector will probably continue to fall, even if at a diminishing rate. It is estimated that there will be 20 to 25 thousand fewer jobs in Budapest's industry by 2005. Only the construction industry can be expected to offer more jobs in Budapest.

Industrial investments in the agglomeration will create new industrial employment possibilities to some extent.

- *Spatial changes in the location of industry*

Industrial differences between large regions are likely to increase further. The central and northwestern regions of the country will monopolise production to an ever increasing extent. In addition, industrial centres may exert their influence over larger and larger parts of the surrounding areas. Not only will Budapest's agglomeration be linked more closely to the centre, but dynamic industrial centres (such as Székesfehérvár, Esztergom, Tatabánya and Dunaújváros) in Budapest's vicinity will also be increasingly become associated with each other, thus contributing to the emergence of a contingent industrial region.

Two-thirds of *greenfield* investments with foreign capital have been carried out in Northern Transdanubia (lying close to the Austrian border) and another 20-25% in the Western part of the Budapest agglomeration. This significant industrial capacity is going to produce with increasing intensity in the near future. It is conceivable that a single large industrial region will emerge between Hungary's Western border and the capital. This industrial region is going to be united by an infrastructural network and a common job market. The development of industrial connections can also be expected, since many companies belong to the same sector (car industry and other areas of the machinery industry). Subcontracting networks will become increasingly interlinked. There is little doubt that only this region stands a chance of becoming a high-tech production area in Hungary (Gy. Barta, 1998, P. Tamás, 1995).

3.3. Industrial, technological and scientific parks

Industrial parks are enterprises that provide infrastructure and services in order to attract other enterprises (mostly small and medium-sized enterprises) to settle in the park. The idea of industrial parks was originally conceived as a form of real estate investment. Later industrial parks were developed that could fulfil various additional functions. They enhance innovation and structural transformations, make the practical application of R&D results possible, allow companies settling in the park to develop various joint-ventures with each other, act as an 'incubator' for newly-

launched enterprises and participate in regional development programmes for peripheral territories. In the course of time, different types of parks have evolved, including scientific parks, technological parks, innovation centres and commercial parks, etc. (Benko, 1992).

Industrial parks in Budapest

At the outset, industrial parks were established through local initiatives (enterprises of local governments or companies). The first Hungarian industrial parks, in the beginning of the 1990s in Győr and Székesfehérvár, were also created by such entrepreneurial associations. Industrial parks, however, began to be established in large numbers after governmental funding had been made available for such projects (Ipari parkok, 1998).

Settlements and enterprises first have to apply for the right to call their development projects 'industrial park'. Only in possession of this title are they then allowed to submit an application for governmental funding. There are 75 industrial parks officially registered in Hungary at present, but only two dozens of them have actually been able to attract new investments.

There are two official industrial parks in Budapest (i.e. with an officially registered title):

The *Industrial Park of North Pest* has been conceived to foster the development of Káposztásmegyer (IIIrd district). This park is not yet active. It is to further the creation of jobs, industrial transformation and urbanisation. It is hoped that many potential subcontractors of multinational companies in Újpest (IVth district) will opt to utilise this park.

The *ECO Industrial Park* is being planned in an area in joint ownership of Pestszentlőrinc (XVIIIth district) and Vecsés. The park is to settle on the premises of the former Soviet military barracks. Given the geographically advantageous location of this area (proximity of motorways and airports), various logistical function could be sited here. The area is temporarily

being used for other purposes. Unfortunately, the development of this industrial park is now being jeopardised by political differences between the two local governments involved.

Technological parks

The decision to create the first technological park proper was passed by the government in May 1996. As a consequence, the Informational and Technological Innovation Park (short: Infopark) was established on a 0.021km² large area. (This area had been formerly designated to accommodate the World Exhibition in 1996, but Hungary's application was later withdrawn.) The owners of the Infopark are the University of Budapest (ELTE) and the Polytechnic of Budapest (BME) jointly holding 25%, the National Technological Development Commission (OMFB), holding 25%, the Hungarian Development Bank with 49% and the Ministry of Economy with holding a 1% 'golden' share (Gróf, 1999).

Originally, the building of 150 000m² of office space was planned on both the northern and southern parts of the Infopark. These offices were to be leased to multinational, information-technology and telecommunications companies. *The chief aim in creating the Infopark was to establish a co-operation between the two participating universities, on the one hand, and companies leasing the offices, on the other.* The planned co-operation offers various advantages:

- Assuring state-of-the-art R&D activities. (An 'incubator-house' located in the park is to make it possible for small and medium-sized enterprises as well as for the two universities to participate more actively in research and development. Enterprises settling in the park belong to leading industrial sectors that exert a considerable influence on other areas of the Hungarian economy as well). The Infopark is intended to contribute to fostering the 'informational society' by housing multi-media educational institutions and enterprises.
- R&D activities of the Infopark can be taken up by industrial parks to produce new kinds of products (technological parks do not engage in production and marketing themselves).

- The Infopark can create jobs for highly qualified experts (for instance, the IBM research centre is to employ about 400 people).
- Significant foreign and domestic non-governmental sources have signalled their willingness to participate in running the Infopark. This will improve research opportunities for the universities involved. A German investor already donated, for example, 1 million DM (US\$ 535 million or € 511 million) to the Infopark Foundation, but even greater amounts will be brought in by some other foreign investors).
- The Infopark will significantly contribute to re-enforcing the central function of the capital in the region.

The realisation of these priorities has reached the following stage by now:

- An environmental rehabilitation project has been started. (The actual area of the Infopark is at the location of the former Lágymányos-lake that has been filled up by various waste materials in the course of the last decades).
- The construction of the IBM building was started in the beginning of 1998. The building can be occupied by the company at the end of August-September 1999.
- The accessibility of the Infopark by means of public transport is still unresolved (the fourth subway line, a new tram line on the Lágymányos-bridge and the extension of the no. 19 tram-line cannot be carried out in the short-run).
- Despite considerable efforts to this end, the Infopark could not persuade Nokia to move its research centre to the park (the main reason being that they could not satisfy Nokias demand for parking places; in addition, Nokia was not willing to await the end of the much delayed building construction).

- The Infopark established a joint venture with the German IVG/DeTe group (this entrepreneurial group donated the above mentioned 1 million DM to the Infopark Foundation). This group is responsible for the construction of the MATÁV (Hungarian telephone company) building as well as the central building of the Park which is to include the incubator-house as well. The construction of the MATÁV building was started at the end of 1998, it is going to be opened around mid-2000.

Thus it can be said that investments launched at the Infopark have a promising future, even though the park is not operative yet. The co-operation between the two universities, the University of Budapest and the Polytechnic of Budapest, has also had a positive start on the university premises at the park. After the completion of the other investments within the next two or three years, the Infopark is certainly going to play an important role in Hungarian research and development (especially due to its modern office infrastructure).

Other technological parks

It is important to mention that other technological parks are already operative in Budapest, even if the activities of these do not meet the standard definition of a technological park in every respect. One example is provided by INNOTECH, a 10-year-old project under the auspices of the Polytechnic of Budapest. The park, the operation of which has already become moderately profitable, is 9000m² large. Enterprises located here employ approximately 150 people.

The Graphisoft Park is an even more important example. Its construction was begun on the Óbuda Island in 1996 when Graphisoft purchased a 70 000m² large part of the premises of the former gasworks from Budapest's Local Government. This park accommodates various software-companies. More than 20 000m² of offices are planned in the Graphisoft Park to be surrounded by a park with sports facilities and restaurants. The renovated building of the gasworks is going to house an industrial museum.

No similar technological parks operate outside Budapest. At the same time, a number of interesting plans have been already formulated, particularly in association with various universities.

Budapest, a future technopolis?

It is likely that the completion of the Infopark will adequately meet demands for technological parks in Budapest. The XIth district will be enjoying a privileged position with two universities, several research institutes and the Infopark itself. Such concentration of knowledge may also lay the groundwork for the creation of a future technopolis. This could offer prospects for abandoned and dilapidated industrial plants in the vicinity, most of which are advantageously situated along motorways leading out of the city. Technological parks are not well suited for carrying out the experimental phase of R&D activities and even less for industrial production, logistics and marketing. These functions could be taken over by industrial plants now in disuse.

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