Convergence of Small Open Industry in Estonia

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Structural changes in industry – including those in post-socialist countries and due to convergence – have been discussed in numerous studies, for example: Gaynor & Karakitsos (1997), Martin (1998), Mathieu (1996), Nilsson (2001), O'Collins, Davis & Daniel (2001), Pohl, Djankov & Anderson (1996), Porter (1990), Sachs (2000), Schüsselbauer (1999), Stehrer, Landesmann & Burgstaller (1999), Tyrväinen (1998), Venables (2000). However, these studies have not paid due attention to the historical development of industry and problems connected with climatic factors. In addition, the effect of all external factors on a small and open industry has not been considered sufficiently. The aim of this article is to fill in these gaps and to elaborate theoretical foundations of the convergence of a small open industry applicable in Estonia. This would enable to more efficiently improve the structure of the Estonian industry and to raise its competitiveness (especially through convergence with developed industrial countries in the European Union and elsewhere). Convergence of industry is studied as important factor for social convergence.

Situation and Developments in Socialist Period

By the ends of 1930s, Estonia had developed an industry that was internationally rather competitive and satisfied the needs of a small country. Its level was approximately equal to that of the neighbouring country Finland, today an advanced industrial country and member of European Union. Unfortunately, the natural evolution of Estonian industry was interrupted by Soviet occupation. For half a century, Estonian industry was forced to serve the interests of the Soviet Union. Industrial policy was dictated from Moscow and thus it developed features characteristic of colonial country.

The forced development of industry in Estonia in the post-war period was probably due to several intertwined aims, reasons and factors. Among these the most important were the following (Kilvits, 2001a, pp. 330-331):

* The establishment of new industrial enterprises and enlargement of the existing ones created new jobs in Estonia. Hence, taking advantage of the shortage of local labour, Moscow was able to accomplish one of its major strategic goals – *russification* – by means of importing Soviet labour. The changed industrial structure and ethnic composition of the population (creation of the so-called civil garrisons) helped to complete the annexation of Estonia to Russia. Estonian industry was integrated into the "Soviet Union's unitary national economic complex" and made fully dependent on it.

* The forced change of the Estonian industry was not a unique undertaking in the Soviet Union at that time. A campaign of industrialisation was in progress all over the Soviet Union. There was an ingenuous faith in the priority development of the production of producer goods (heavy industry). The emphasis in the whole Soviet Union was primarily on material production.

* Investments made in Estonia were more efficient than in most of the other Soviet Union regions because industry in Estonia was relatively well developed with good production experience and a skilled labour force; the infrastructure was in relatively good shape and, thanks to resourceful agriculture (at least before the private farm-based agriculture was collectivised), foodstuffs sufficed for industrial workers.

* Large shipments of German machinery and equipment received as reparations were transported to Soviet Union by sea via the port of Tallinn. As transport within the Soviet Union worked poorly, equipment began to pile up in the ports. As a result, it was easier and more economical for Moscow to use the machinery and equipment in Estonia.

Estonia had an important natural resource – oil shale. The forced development of industry was also promoted by forest resources and the possibility to produce building materials here (there were both local natural building materials and brickyards, cement and lime production, etc.).

A favourable seaside and economic-geographical position enabled the development of the marine branches of industry in Estonia: ship repairs, manufacture of fish products, etc.

In the spring of 1945, Moscow resolved to start exploiting the uranium ore deposit in the Northeast of Estonia, which was one of few known at the time. The decision had a strong impact on the industrial development of Northeast Estonia as well as the whole Estonia.

Besides local labour and that recruited from the Soviet Union, about 4000 German, Austrian, Hungarian and Rumanian prisoners of war and also many Soviet soldiers were employed for many years for the construction of industrial enterprises in Estonia in the post-war years.

Investments were made primarily in branches oriented to consumers outside Estonia (i.e. to the all-Union market). The forced development of the engineering, chemical, textile (especially cotton) and other industries greatly exceeded local demand.

Industrial production was concentrated mostly in large enterprises, which in addition to production provided many social services and fulfilled control functions.

The territorial pattern of the Estonian industry deteriorated. Approximately two thirds of the local production capacities was concentrated in three North-Estonian cities: Tallinn, Kohtla-Järve and Narva.

The collapse of the Soviet Union was preceded by a long period during which resistance to changes and reforms was regarded as stability, while at the same time it created a self-destructive instability. It became evident eventually that the kind of industrial policy that was used in Estonia and all Soviet union in the post-war period was unsuitable even for socialism (Kilvits, 2001a, p. 332):

Central planning gave rise to huge structural distortions. There were long-term structural deformations due to the inappropriate pricing of key productive inputs. Freight costs were treated as close to zero, resulting in numerous highly unsuitable location decisions. Land was usually treated as costless in enterprise accounts, resulting in exceptionally wasteful use of land.

Depreciation of productive fixed assets of Estonian industry increased considerably during the twenty-year period from 1970 to 1990. Depreciation (as percent of total cost at the end of year) was 27.3% in 1970 and 52.1% in 1990. This trend was increased by the fact that the replacement of productive fixed assets had decelerated while their dropout had decreased. Approximately a quarter of the machinery and equipment needed immediate replacement in 1990. Over a third of the workers were engaged in primitive and hard manual labour. The yields of capital investments had continuously decreased over the preceding twenty years and material and energy intensity remained almost unchanged. The overall efficiency of the industry declined continuously.

This industrial policy failed, because it was unable to maintain a trajectory of increasing productivity. The structure of Estonian industry that had developed in the post-war decades did not satisfy the requirements of the changed situation and became an obstacle to further growth.

Radical economic reforms in Estonian industry began in 1987-1988. Some liberalisation of Soviet Union internal policy enabled a group of theoreticians and practitioners to debate the idea of economic autonomy (IME). In 1990, an important change occurred in the strategic aims of reforms in Estonia. The further liberalisation of the Soviet Union and weakening of central power enabled to replace economic autonomy, which had formerly been priority, with the goal of political independence or the task of re-establishing independence statehood of Estonia. The target for economic reforms became the restoration of market economy and reorientation to the Western market. The transition to a market economy was strongly supported by the reestablishment of independence (August 1991). The Monetary reform (June 1992) detached the Estonian financial system from the rouble zone.

Structural Crisis

The structure of the Estonian industry that had developed during post-war period did not satisfy the needs of newly independent Estonia in transition. The Estonian industry was transformed to satisfy the needs of the Soviet Union and centralised command economy. Estonian industry was essentially a collection of enterprises located on Estonian territory.

Owing to the Soviet Union's closed market, enormous natural resources and deficit economy, its industry did not compete with the non-communist world. As the relative prices versus open economies were distorted (unreasonably low prices of energy carriers and raw materials, railway transport, etc.) mostly material-, energy- and transport-intensive enterprises were founded in Estonia. Moreover, the quality of products produced in Estonian industry was usually low (Kilvits, 2001a, pp. 332-333).

Estonia opted for a market economy and saw substantial reduction of its economic dependence on Russia and reorientation to western market as preconditions for gaining real political and economic independence. This reorientation was actually quite unavoidable as by that time the eastern market had considerably contracted and become unreliable. Moreover, the excessive dependence on Russian markets would have restricted the technological and economic rearrangements. Many large industrial enterprises had to make a choice: whether to start producing goods that could be sold in the world market or vanish. Estonian industrial enterprises that had formerly produced goods for eastern market, based on the plans approved by Moscow, found themselves amidst new conditions. If before an enterprise's management had primarily focused on the problems of manufacturing technology and supply, they now had to determine what to produce and for which market. The monetary reform complicated these developments even further and detached the Estonian financial system from the rouble zone (bringing about disturbances in clearing accounts with the rouble zone countries). Undervaluation of the Estonian kroon made imported raw materials very expensive, with a result that a large part of industrial production became unprofitable. The high rate of inflation before the monetary reform and unfavourable exchange rate imposed by the monetary reform reduced considerably the current assets of enterprises. The situation was so much complicated that there were even difficulties with distinguishing between causes and effects.

Figuratively speaking: the Estonian industry had to start below the zero level. To begin its economic transformation, the Estonian industry had to get rid of the unsuitable old structure and only then start to build up a new one. The structure of the Estonian industry that had developed during the post-war period did not satisfy the needs of the newly independent Estonia

in transition. The worst was that the problems were quite unusual. These were highly specific problems of a post-socialist and post-colonial country. The interaction of these two situations complicated the transition more and made it rather schizophrenic. There were no analogues to the industrial development in Estonia. For many reasons and indicators, the situation was unique. Estonia was undergoing reindustrialisation or in some cases even deindustrialisation instead an ordinary industrialisation. It was believed that the existing industrial structure would be likely to collapse and a new one would be founded on its ruins.

In 1990-1991, a considerable decline in production volumes occurred and in 1992, a real structural crisis ensured. In 1990-1991, production was essentially hampered by shortage of raw materials, but since 1992 the main obstacle has been insufficient demand. In addition to the general problems of all Estonian industry (contraction of the Eastern market, rise in the prices of raw materials and energy, low purchasing power of the domestic market, etc.), several industries had also specific reasons for reducing production (Kilvits, 2001a, pp. 333-334):

The great decline in the output of power utilities was caused by the reduced production volumes in the whole Estonian economy (consumers of electric energy), hard savings and introduction of more energy-saving technologies.

The declines in the production of fuels, predominantly in oil shale industry, was caused by considerably declined demand for oil shale by thermal power plants and oil shale chemistry.

Food industry, for the first time in 50 years, had to seriously consider the competition of imports in the Estonian market. The supply from Estonian agriculture and fishing decreased. Due to the big debts (insolvency: bankruptcy) a food industry enterprises and also due to the relatively high taxes, high costs of processing and high retail mark-ups, a large portion of agricultural produce was sold directly by agricultural producers, either after primary processing or in unprocessed form, at the marketplace.

The output decline in building materials industry, which had used mostly local raw materials and sold most of its production in Estonia, was caused by considerable decrease in construction volumes and the changed

structure of construction works (predomination of repairs and reconstructing) due to the economic crisis.

The domestic demand for furniture declined sharply due to the decline in housing construction, etc.

According to the Statistical office of Estonia, the industrial output decreased in five successive years (1990-1994) compared with the preceding year. In 1994, only about half of volume of 1989 was produced. While in 1991 industry contributed 34.3% of Estonian GDP, then in 1994 only 18.2%. In 1991, Estonian industry consumed 3.23 TWh electric energy, in 1994 only 2.09 TWh, in other words 64.7% of those volume of 1991. In 1989, the Estonian industry employed 221.3 thousand people, but by 1994 only about 130 thousand people were still employed. Rapid structural changes occurred in Estonian industry and in all its branches separately (Kilvits, 2001a, p. 334).

Now, in September 2002 we can conclude that large-scale deindustrialisation and tertiarisation have taken place in Estonia since the reestablishment of independence. There have been large (and possibly irreversible) declines in overall employment levels and employment rates.

Industrial restructuring has gone through a number of phases. There was a dramatic transformation crisis in the first phase (1991-1994), followed by the beginnings of sustained growth. Estonia experienced a secondary transformation crisis in 1998-1999 (resulting from the Russian crisis and, essential decrease of Estonian exports – mainly food products – to Russia).

Estonian industry today is thoroughly different from Estonian industry in 1990. Structural problems of Estonian industry in September 2002 reflect a world-wide techno-economic paradigm change which, in its social effects, can be compared to the two previous industrial revolutions. Behind this change is the globalisation of the world economy and the breakthrough of new technologies, especially in information processing and communications.

Fundamental Principles of Industrial Policy in 1991-2002

The level of industrial development is rather low in Estonia and fast industrial growth is badly needed here to catch up with economically more developed countries. Estonia's catching-up is to be treated in the convergence context, which is also one of the high priorities of EU.

All Estonian governments, regardless of their political and personal disagreements, have pursued very liberal and un-protective industrial policy. Such industrial policy has not been carried out for clearly and accurately formulated ideological reasons, the more for correct economic-theoretical reasons, but simply because Estonia actually had no choice. Owing to the concrete political and economic situation, the play of newly independent Estonia was very narrow in the sphere of industrial policy. It was actually rather a compulsion and following at the heels of events than a conscious and systematic activity.

Openness of the Estonian industry has been neither an ingenious industrial policy measure nor a fixed idea but simply an objective necessity. A country with a very small home market as Estonia cannot exist as a closed system. It inevitably has to accept an open economy. As the Estonian industry is extremely open, its development depends on many external factors. Estonia depends especially on the welfare (general economic situation) of its main foreign trade partners (Finland, Sweden, Germany) including subcontracts. Estonian industry depended on German economy due to the fixed exchange rate of the Estonian kroon against the German mark (from the year 1992, Estonian monetary reform, till 1998). Since 1999, the Estonian industry depends from all European Union (at least EMU, Economic and Monetary Union) economy due to the fixed exchange rate of the Estonian kroon against euro (and also from the exchange rate between euro and US dollar).

Estonian industrial policy has been based on the assumption that the goal of Estonia is the **accession to the EU**. Without idealising this economic alliance, Estonia cannot stay between Russia and expanding EU, even at the greatest desire. Accession of Estonia to the EU would offer Estonia political protection and relatively fast and stable economic development.

Estonian industrial policy has been **un-protective**, it has been largely based on the fact that the decisions made by investors and commercial banks make money concentrate just where it produces more and minimises risk. The success of a branch or an individual industrial enterprise in Estonia has been determined by its ability to find its own niche in the world market, raise needful investments and credits, reproduce itself successfully, etc. Selective promotion of industries, enterprises or regions seemed extremely dangerous to Estonian industrial policy makers and executors for two reasons:

In a radically changed economic environment it is actually impossible to tell what is an ideal structure of industry, what are the fields of activity which should dominate in Estonia, and what would be the cost of possible privileges for their promotion. Under the limited information and uncertainty it is quite doubtful to see a longer perspective. It would mean taking direct or indirect risks at the expense of taxpayers. Mistakes in determining priorities usually cause more economic damage than letting things drift.

Selection of branches, enterprises or regions to prefer or protect would mean channelling of taxpayers' money into one or another field of activity. That is why this kind of industrial policy requires social and political agreements, especially between different social groups, political parties and regions. Sharp accusations of discriminating against other branches-sectors and regions should be faced. There can also arise different opinions between producers and consumers. The unemployed and those who think unemployment is no concern of theirs have different attitudes towards protective industrial policies.

Estonian industrial policy has in every way promoted **privatisation**. The structure of industry did not satisfy the needs of Estonia and had to be changed. The use of state budget resources for structural policy aims was extremely limited. The foreign aid and loans received from the West were not sufficient, either, and the state simply could not manage such a large number of enterprises. We like to speak that State is a bad owner. May-be it is so. May-be it is not. But the newly independent Estonia faced a very specific situation. All-Union ministries, administrators of Estonian industry, remained in Moscow, in the capital of other country. The Communist Party as important ruler of industry, disappeared at all. The

people's control Committee of Estonian SSR was unexpectedly liquidated. Estonian industry, belonging to the State, remained actually without administration, not to speak of strategic planning. Creation of state-owned joint-stock companies and their boards did not give desirable results, either. As a matter of fact, there was nobody between Director of a state industrial enterprise and God. Just the shortage of money in the state budget and inability to manage state-owned enterprises were to main reasons for the rapid decision to privatise most of the industry. It was decided: everything that can be done by private capital should be left to private capital.

Estonian industrial policy has in every way promoted **foreign capital** inflow. Reformation of Estonian industry at the expense of internal accumulation would take decades. This is a quite unrealistic development because history wouldn't enable Estonia such long and slow development. Due to the shortage of domestic savings there is the shortage of domestic capital. Thus, the restructuring of industry is possible only in case of sufficient foreign investment.

Estonia has, of course, also a classical (usual European) innovation system, but compared with foreign direct investments, its importance is petty.

The goal of national industrial policy is the competitiveness of the country (international competitiveness of companies and promotion of efficiency and growth of national economy). Modern industrial policy covers a wide spectrum of tasks. It includes all public sector tasks affecting the operations and structures of companies. The preparation of industrial policy occurs on different levels and at the initiative of many parallel administrative units. In order to improve the efficiency and effectiveness of industrial policy, there must be good co-operation and co-ordination between different administrative levels and units. The implementation of industrial policy is shared between many parts of public administration. An important task of the State industrial policy is to co-ordinate the actions of the authorities and increase their effectiveness.

Convergence in Modern World

The world is globalising. This process is favoured by technological progress, liberalisation of international trade, free movement of capital,

merging of enterprises with international corporations, subcontracting for firms from other countries, economic unions etc. External impulses are playing an ever increasing role in the development of nations. As the Estonian industry is very small and extremely open, its growth depends on numerous external factors:

* From convergence on more advanced industries in Europe and all world, specially on industries' main foreign direct countries-investors and main foreign trade partners (including customers of subcontracts).

* From foreign direct investments as an important contribution to the process of restructuring, economic growth and development of technology.

* From welfare (general economic situation) of main foreign trade partners (Finland, Sweden, Germany, etc., mainly EU countries), including customers of subcontracts.

* From European Union (at least EMU, Economic and Monetary union) economy due to fixed exchange rate of the Estonian kroon against euro, and from the exchange rate between euro and US dollar.

* From integration with EU (harmonisation of Estonian industry with requirements of EU: industrial policy, standards, etc.).

As Estonian industry has been largely privatised by today, the playground left to the shape the industrial structure is quite limited. Owners, investors, commercial banks are those who decide.

Growth has traditionally been treated as accumulation of physical and human capital. Poor countries – if they are well governed – have a clear advantage: if there is a shortage of capital it earns high profits, which stimulates its influx from other countries. As a result, the difference between rich and poor countries should decrease. This process is called convergence (levelling of incomes and other economic indicators – including the technological level of industry).

The conclusions of two main theories of economic growth – neo-classical and endogenous – about the convergence between states are different. Namely, according to the neo-classical theory the levels in different states are converging whereas in the endogenous theory this conclusion is generally not valid.

The neo-classical model assumes that there are diminishing returns to investment in physical and human capital, and predicts a general convergence of incomes and growth rates. The characteristic of endogenous growth models is, by contrast, constant of increasing returns to capital, and therefore they are consistent with underdeveloped economies remaining poor and with the observed divergence in per capita incomes.

One explanation of why both the neo-classical and the endogenous growth theories are unable to account for the fact that the fastest growing countries are developing countries, and at the same time there is no tendency for general convergence, is that the quality of governance has been left out both of them.

Differences in total productivity of countries have two reasons:

* the productivity in (sub)sectors is different (technological level, capital–output ratio, skilled labour);

* labour is concentrated into (sub)sectors of different productivity. This is caused by earlier activities and investments into technological development and improvement of labour skills.

Differences in aggregate productivity may be due to differences in sectoral mix, in the level of technology and/or capital intensity. Some industries produce more value added per worker than others, owing to the use of large amounts of capital or skilled labour or of advanced technology. It is possible for countries to have the same labour productivity at the industrial level, but nevertheless to have different levels of aggregate productivity because one country's employment mix is shifted toward high-value-added sectors.

Among advanced economies there has been a marked tendency for aggregate productivity levels to converge. But there is no clear trend toward convergence in the post-war period. The convergence between the states is not unconditional but conditional. If the conditions determining the equilibrium state of the economy are not similar between two states, their levels cannot become even. Instead, the states are approaching quite different equilibrium states.

Poor countries have low levels of savings and investments, and this deficiency is one of the key factors holding them back from rapid growth and from convergence on more advanced economies.

Outward-oriented economies develop more rapidly. Outward orientation is achieved through a relatively liberal regime for foreign trade and investment and through good exchange rate management .

In 1950s, the labour productivity advanced in world industry was rooted mainly in two factors (Dollar and Wolff, 1993, p. 13):

*the use of more capital per worker at the industrial level;

* superior technology in virtually every industry.

Both capital accumulation and technological advance played important roles in labour productivity convergence within industries. Technology catch-up was particularly important until mid-1970s: up to that point technology convergence among advanced economies was the main driving force for labour productivity convergence.

The golden age for European convergence (especially in the context of catching up the United States) was between 1950 and 1973. Intensive fixed investment in machinery and equipment, large stocks of human capital with skills to adapt new technology, domestic and international institutional arrangements provided a favourable environment for economic growth (Rajasalu, 2001b, p. 15).

The author's attitude toward the opportunities offered by convergence in general and its opportunities to affect the industrial structure of a single state is rather cautious. There has been a substantial increase in the economic inequality between nations in the past two and half centuries.

Economic inequality of states has been increasing. Although developed states have converged with one another to some extent, the world as a whole has not. There is reason to speak about regionalisation rather than globalisation. The lion's share of production and capital and commodity flows are concentrated into three economic blocs (European Union, NAFTA and the Far-East and Japan). Differences in the technological levels of states are increasing. Free movement of goods, services, capital and labour should – at least theoretically – favour convergence. However,

statistics does not confirm levelling of industrial structures in different states.

As far back as in 1776, Adam Smith predicted in *The Wealth of Nations* that globalisation would be a force of economic progress. Smith stressed that not all parts of the world would benefit equally from the expansion of world markets. Smith identified three factors that would lead to divergent outcomes despite the common pull of globalisation:

* national policies;
* geopolitics;
* physical geography.

Sachs (2000) distinguished between five different patterns of development, and illustrated how each is related to the underlying geography, economic policies, and resource endowments of a country:

Endogenous growth is a process of self-sustaining increases in income generated mainly by technological innovation. Innovation raises national income, which in turn stimulates further innovation in a positive feedback process.

Catching-up growth is the process whereby an economy with a lower level of technology and income (the "follower") narrows the income gap with the higher technology and richer countries (the "leader") through a process of technological diffusion and capital flows from leader to follower.

Resource-based growth is the process whereby an economy experiences cycles of per capita income mainly as the result of resource booms and busts.

Malthusian decline is a process of failing per capita income caused by population pressures outstripping the carrying capacity of the local economy, in circumstances in which the country is neither innovating nor successfully adopting technologies from abroad.

Economic isolation is phenomenon of economic stagnation that results from economy's physical or policy-inducted isolation from world markets.

In the modern world, an intractable division of states is taking hold, based on technology (Sachs, 2000):

A small part of the globe, accounting for some 15% of earth's population, provides nearly all of the world's technology innovations.

A second part, involving perhaps half of the world's population, is able to adopt these technologies in production and consumption.

The remaining part, covering around a third of the world's population, is technologically disconnected, neither innovating at home nor adopting foreign technologies. Sometimes, the needed technologies are available abroad, but the countries are too poor to buy or license them on the necessary scale. Often, the technologies do not exist in appropriate forms, and poor-country markets often scant incentives for research and development.

The world's new boundaries are not fixed: many of the technologically excluded could soon become technological adopters, and a few have graduated from the middle group to become top-rank innovators. But such transitions are far from automatic. In principle, each state or region can make efforts to reach a higher technological level. Yet there are no guarantees for results. Poor states can succeed only if they have efficient institutional systems and economic policies.

In other words: economic catching-up is usually treated in the convergence context. However, convergence is not a universal process that takes place everywhere and any time.

As a rule, technology converges less in the modern world than capital does:

States and regions with developed technologies have clear advantages in further technological development – new ideas are usually a new combination of old ones. An environment rich in ideas is suitable for new ideas and innovation. Analogously with the nuclear reaction first a critical mass of ideas and technologies is required. Only then can the reaction follow.

Innovation depends significantly on the size of the market – each innovation has fixed costs (for example, the cost of R&D). A larger market supports making such expenditures better than a small one.

For successful innovation support (government) institutions are required. Business innovation is often a result of some R&D project carried out in the public sector. As a rule, for successful innovation higher education, academic research and government programmes are needed.

Business innovation is often a spin-off of military or space research financed by the state. Large and rich states that invest heavily into military or space research have therefore indisputable advantages for business innovation.

Innovation is not any longer based on a linear model of development (formation of an idea and basic research; applied research and development; production; consumption). The technological level does not depend solely on domestic R&D but on the ability to adopt technologies developed elsewhere. Technological transfers between states can in general case be described by four basic models:

* the immigrant's model focuses on brain drain and attraction of skilled labour power from other countries;
* the hardware model on large-scale imports of industrial equipment;
* the software model on acquiring technological information;
* and the capital model on attracting foreign direct investments.

As Estonia is integrating with the EU, taking step by step over its industrial policies, standards etc. and the bulk of Estonia's exports go to member and candidate states of the EU, the structure of Estonian industry depends notably on the industrial structure in the EU.

Estonia has a splendid opportunity to integrate with the European Union, which in essence is a North–South type of economic union (its members are developed as well as less developed states). A characteristic feature of such a union – differently from a South-South type union, which includes only developing countries – is convergence. Namely, in the context of relative advantages the supply of countries with various production factors is of crucial importance and liberalisation results in either trade creation or, on the contrary, in trade diversion (Venables, 2000; Rajasalu, 2001a, pp. 10-13):

In the economic unions of North-South type, liberalisation of trade brings forth greater flows of goods from developed countries into developing countries and vice versa. Liquidation of trade barriers creates additional

resources and abundance of goods. Capital-intensive goods from developed countries do not oust domestic products of little capital intensity in developing countries; instead, they complement their structure. The products of developing countries whose capital intensity is low (and material or labour intensity high), however, do not compete in developed countries with their capital-intensive products. For both parties an additional resource becomes available.

In the economic unions of South-South type, both sides usually possess similar production factors and have similar relative advantages. If markets are mutually opened, the goods of the more successful country enter the markets of less successive one and compete domestic producer out of this market. Additional trade flows retard well-being in the less successful country (closing down product), while in the more successful one the economy will grow as previously thanks to output of products with low capital intensity. Therefore, no essential changes occur in the production structure, there will be no transfer to a higher technological level or any significant production growth.

Agglomeration is understood as accumulation of capital in one place (concentration), the economic effect of which is notably higher than the effect achieved if the same capital was dispersed. For an investor the decisive factor in selecting the place where to make an investment is the amount of capital accumulated (invested) there before. The success of a state or region in attracting capital depends on the existence of scientific institutions, business research centres and firms offering various professional services (accounting, auditing, legal consultation etc.). Clustering (concentration) of enterprises in some region makes it cheaper to organise subcontracting, buy services, improve infrastructure and exchange know-how there.

For an enterprise it is easier to specialise production in a large and concentrated economy than in a small and dispersed economy. In most cases investments are needed to start industrial production (fixed costs), and to guarantee their pay-back a certain level of demand is required. As a rule, high-tech research-intensive (sub)branches with high value added require greater fixed costs. As a rule, such production cannot be established in a small and dispersed economy. For this reason a fixed hierarchic order of (sub)sectors has become established (depending on the

size of the market). High-tech enterprises with a large amount of value added in large and dense economies have usually clear competition advantages.

The following forces act in agglomerations:

* Gravitation forces, which attract capital-intensive production (external effects of knowledge and technology; effects of labour accumulation; influences of interrelationships between buyers and sellers).

* Centrifugal forces, which push labour, energy, material and land-intensive production to peripheral areas of the agglomeration or outside the agglomeration (pollution effects due to production concentration and other external effects; competition for local production inputs; demand by customers outside the agglomeration).

An economically successful region (the so-called core) concentrates as a rule high-tech, research intensive, high value added production. Capital, energy, labour and land intensive production (usually inefficient) is crowded out of the core, into the periphery.

A North-South type of economic union has advantage also in spatial localisation and concentration of production. As production develops, agglomerations and clusters are formed. In an agglomeration both gravitational and centrifugal forces act, which attract capital-intensive production and keep labour- and material-intensive production in the peripheral areas of the agglomeration or outside of it (Venables, 2000; Rajasalu, 2001a, pp. 11-13):

In the North-South type economic unions, the concentration of production and capital is high and agglomerations and clusters are already established. Agglomerations attract scientific-technological and creative potential. New high-tech and capital-intensive productions are continuously cropping up in agglomerations as these try to locate in agglomerations. In parallel, various traditional industries are ousted from the agglomeration or are relocated to peripheral areas or outside the agglomeration (into developing countries).

In South-South type economic unions, agglomerations are only forming. Their scientific-technological potential is too scarce to attract high-tech production. In the neighbouring countries that are at the same level there

is no mobile potential to speak of what could be attracted. Persons with higher potential are drawn into the so-called North countries with whom the South is unable to compete. The importance of capital and technology transfers is low in South-South type unions. Instead, the effect of opening of markets dominates, which enables the countries whose level is a little higher to make better use of their relative advantages and expand exports. The economy of less developed countries will not endure the competition and will contract. The result is increasing divergence.

Integration with the EU as a North-South type economic union, not to speak of joining this union, offers Estonia good opportunities of convergence. If Estonia is left out of this union some kind of new union should form, which would be a South-South type union in which some countries may be successful, yet opportunities of general economic growth and convergence are meagre.

Agglomeration influences also tax competition. Thanks to advantages given by the agglomeration core states (developed industrial countries) can impose higher taxes on their enterprises than peripheral countries (developing countries), while they need not fear outflow of (high-tech) capital (flow into the periphery). The money collected as taxes enables the core (developed industrial countries) to finance R&D and ease social problems. In developing countries, however, the financing of R&D and social programmes is extremely limited due to shortage of money (low tax revenue).

By today comprehensive international division of labour has become established, and in this framework the competitive advantages of countries having highly developed technologies increase further. Underdeveloped countries and regions find themselves in a witch's circle in which poverty produces new poverty. In the world economy clear core(s) and periphery(ies) have formed by today. For various objective and subjective reasons Estonia has stayed in the periphery.

States as well as economic unions are fighting fiercely for high-tech, research intensive, high value added fields. The fight is going on also within economic unions. This is understandable as all states and economic unions would like to have these highly profitable fields. It is only non-standard decisions that can help us improve our economic situation.

Convergence is supported by international capital flows. After the upheaval in Central and Eastern Europe, massive investments are needed to modernise all aspects of the industry and to improve productivity. Transition countries in general have low levels of domestic savings due to the low income levels. Foreign direct investment (FDI) is an important contribution to the process of restructuring, growth and development of technology. Although foreign investors are very careful in placing their money in transition countries, Estonia is – thanks to liberal economic policy and nearness to Finland and Sweden – a country that has been relatively successful in attracting FDI. Although the volume of FDI is quite low in global scale, Estonia is one of the most successful post-socialist countries in attracting FDI on per capita basis.

Convergence is supported also by foreign trade. Since the restoration of independence, Estonia has been committed to pursue the principles of liberalisation and promote the cause of fair and free trade as the most vivid examples of how liberal trade policies support the development of a country in the long term perspective.

Due to Estonia's small size and geographical location, the Estonian economy has a considerable outward orientation. Foreign trade constituted 177.1% of GDP in 1999 (exports 73.0% of GDP and imports 104.1% of GDP).

Convergence is also supported by integration to the EU. Estonia is taking step-by-step over European Union industrial policy, standards etc. Economic integration has a clear effect upon economic growth and equalisation of levels:

Economic agents operating in a larger integrated economic space have a better access to a larger amount of technical information than the economic agents operating in isolation.

Greater openness to international competition enhances technological progress.

Economic integration has a positive effect on economic growth according to both the neo-classical and endogenous theory. Although closer economic integration generally promotes economic growth, integration with the European Union does not automatically bring about a substantial acceleration of economic growth.

Climate as Specific Convergence Problem in Estonian Industry

In 1998, Estonia needed for producing a unit GDP 12.8 times as much energy as Hong Kong, and 4.4 times as mush as Finland. There are two reasons for this:

because of its low technological level and cold climate Estonia requires in practically all fields more energy to produce a unit of GDP than developed countries;

in the Estonian economy the proportion of energy intensive activities is significantly greater than in developed countries.

We can improve our technological level but climate will remain a factor that cannot be affected. Estonia spends much energy on compensating for bad climatic conditions. The average annual temperature in Estonia is much lower than in developed industrial countries. In addition to the low temperature the climate in Estonia is significantly severer than in developed industrial countries – summer and winter temperatures as well as day and night temperatures have greater differences. This makes building significantly more expensive than in southern countries (the foundation has to be deeper, water pipes, sewage, all kinds of cables have to be laid deeper, the walls have to be thicker, multiple window glasses and good insulation are required, the roof has to be strong enough to survive the weight of snow etc.). Buildings have to be heated for half the year. As differences between inside and outside temperatures are greater energy losses are inevitably also greater.

In addition, it is necessary to pay higher wages and salaries in Estonia than in southern countries (people have to heat their homes, need warm clothing and more substantial food etc.), there is no hope that Estonia can compete with southern countries in several traditional production fields.

We have to take into consideration higher costs connected with the climate and that is what the investors, international corporations etc. will do. Low pay cannot compensate for expenditures caused by bad climate. The level of pay is undoubtedly important for investors, but not the only factor considered. In the production costs of Estonian manufacturing industry wages and salaries make up less than a fifth. Because of the climate Estonian economic policy and investors are forced to orient to high-tech, research intensive, high value added fields.

Future Prospects

The main goal of Estonian industrial policy strategy is to increase the international competitiveness of companies and to promote the efficiency and growth of national economy. The industrial policy of Estonia must reach the status and functions of as so-called state business plan. The strategic goal of industrial policy is to achieve growth in percentage of value added in industrial production and to reach the average level of the EU.

Estonian industrial policy and economic environment seem to be quite promising in the convergence context (open economy; no restrictions to current account or capital and financial account transitions; foreign trade is mainly oriented to the EU markets; reliable and favourable business environment; remarkable amount of foreign direct investments).

Nevertheless, there are still some opportunities to make economic environment more favourable for catching-up (technical and technological education, R&D, institutional framework, etc.).

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