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THE STRUCTURAL AND REGIONAL  
IMPLICATIONS OF THE NEW ECONOMY  
IN TRANSITION ECONOMIES



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## SUMMARY

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The industrial transformation that revolutionized the economic and business models of former state-owned enterprises has barely reached an advanced stage before the transforming economies face a new type of industrial revolution. The ‘new economy’ is hammering on their doors.

There is a policy-making challenge of a structural and regional character, besides the conventional one of closing the object and idea gaps between Hungary and the developed economies in this field, by promoting investment in the diffusion and absorption of information and communication technologies.

Hungary’s incorporation into the global structure of world manufacturing brought about a spectacular increase in the share of high-tech products in total output and in exports. Can it be concluded that the country is facing up to the challenges of the new economy?

The paper analyses the lessons to be drawn from the theses of the economics of networks and the characteristics of the new economy’s business models. This puts the apparently positive structural-transformation record of Hungarian manufacturing industry in a different perspective.

The paper also examines the opportunities and limits of supply and demand-based regional development-policy methods, to find out whether regional-development can be grounded on promoting an FDI-based shift from the old to the new economy, also in backward regions.

## 1. INTRODUCTION\*

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The industrial transformation that revolutionized the economic and business models of former state-owned enterprises has barely reached an advanced stage before the transforming economies face a new type of industrial revolution. The 'new economy' is hammering on their doors.

There is a policy-making challenge of a structural and regional character, besides the conventional one of closing the object and idea gaps (Romer, 1993) between Hungary and the developed economies in this field, by promoting investment in the diffusion and absorption of information and communication technologies.

How can structural change be effectively promoted and targeted in a way that incorporates the national economy into international economic structures in an advanced and sustainable manner? Let us take Hungary as an example. Its incorporation into the global structure of world manufacturing brought about a spectacular increase in the share of high-tech products in total output and in exports. The evolution of specialization patterns is reflected by a spectacular increase in intra-industry trade with advanced economies (Carlin and Landesmann, 1997; Éltető, 2000). Can it be concluded that the country is facing up to the challenges of the new economy?

Observers comparing the technology intensity (Éltető, 2000; Inotai, 1999; Soós,

2000) or price/quality position (Landesmann and Burgstaller, 1997) of Hungarian traded products with the indicators for other transforming economies or peripheral EU member-countries, usually reach positive conclusions about the state of Hungary's structural transformation and competitiveness.

*Chapters 2, 3 and 4* of the paper question the universal validity of drawing such positive conclusions from the indicators mentioned. Analysing the characteristics of the business model of the new economy – the overwhelming role of intangibles – gives a different perspective to the apparently positive performance of Hungarian manufacturing. Generalizing from the Hungarian example, are the modernization achievements sustainable in the advanced transforming countries, where the key economic actors are vertically integrated suppliers operating in global, new economy-related industries?

*Chapter 5* tackles the regional implications of the new economy. The objectives of regional policy are to reduce income disparities and promote spatially balanced growth by supporting regional development, so that backward regions would catch up. Most transforming economies display great differences in regional growth rates. Some regions are catching up fast as they turn into growth-poles, while others are still falling behind and some remain hopelessly underdeveloped. These disparities are marked in Hungary, where events of the new-economy type have increased the tasks faced in regional development. Analysis of regional growth patterns suggests that the extensive growth in certain regions is being driven by FDI. The sectoral structure of growth shows a shift from the old to the new economy, driven by greenfield investment in high-tech

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sectors such as electronics, information and communications technology (ICT) hardware, high-tech machinery parts and components *etc.* These rapidly expanding new firms are clustered in a couple of industrial districts in Western Hungary. Such modernization has brought a notably concentrated pattern of growth. The logical question for policy-makers is whether a regional development strategy in the backward regions can also be based on promoting an FDI-based shift from the old to the new economy. This is addressed in the second section of the paper.

## 2. STRUCTURAL CHANGE AND THE ECONOMICS OF THE NEW ECONOMY

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One of the features of industrial globalization has been the break-up of the value chain and the geographical separation of pre- and post-production activities from production (Szalavetz, 2000a).<sup>1</sup> Transforming economies have been major beneficiaries of the disintegration of production (Feentsra, 1998), as important target countries for FDI. This has promoted structural upgrading, by introducing rapidly expanding industries (mainly through greenfield, efficiency-seeking investments) and by renewing traditional ones.

This section focuses on the modernization impact of the new industries, but there are two remarks to be made first about the renewal of traditional industries. (i) Foreign greenfield firms established in some traditional industries (for example steel) can be considered as introductions of something radically new. Foreign steel companies setting up greenfield operations in Hungary

have introduced a new type of declining-sector company. The Hungarian representatives of declining industries lagged far behind the world technological frontier (resembling industrial memorials rather than modern businesses). Ventures in those industries that operated efficiently and profitably in a non-polluting way, with good modern equipment machinery, were new to the country. (ii) Developments in the new economy have dramatically changed some old-economy industries, changing them radically in recent decades. Their technology intensity and capital intensity have significantly increased, for instance. This, in some respects, casts doubt on their categorization as traditional, low-tech industries. In fact, it is time to reconsider the OECD categories of high-tech, medium-tech and low-tech.<sup>2</sup> Industries need to be grouped according to the level of technology they embody, not according to a traditional, branch-specific categorization.<sup>3</sup>

Take the example of the traditional steel-making process. Working conditions are no longer unhealthy and it is not the pollutant process it once was. Its technology is no longer a rigid one calling for huge volumes to achieve economies of scale. Today's steel plants do not contain dirty, sweating, red-faced workers in dark workshops lit only by the red glow of molten iron. Instead, there are skilled, white-collar technicians sitting in front of computers, controlling an automated process. The whole manufacturing process in the steel industry has been changed by information technology.

## 3. NEW INDUSTRIES – NEW ECONOMY

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The introduction of new industries has spurred a spectacular increase in the production and export of high-tech products. The problem with assessment is that the

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<sup>1</sup> On the characteristics of vertical FDI, see Caves, 1982

<sup>2</sup> The categories were set out in OECD (1993) and revised in Hatchichronoglou (1997), which are cited in Éltető (2000).

<sup>3</sup> The topic is dealt with in detail in Baily (2000), Panchak (1998) and Szalavetz (2001).

usual indicators for cross-country comparisons (technology intensity of traded products, proportions of high-tech, medium-tech and low-tech products, or the extent of intra-industry trade with advanced economies) give a distorted picture. One element of this distortion appears, for instance, in the way the static categories of high, medium and low-tech fail to reflect the changes in the technology-intensity of specific industries. Another element is the fact that categories of technology intensity reflect the technology content of the *equipment and products*, but say nothing about the *skill content* of the work input. The local work content of some industries with a high technology content (consumer electronics, cars and car components, or ICT hardware), is not knowledge-intensive at all, but simple and labour intensive (Szalavetz, 1999).

According to the conventional interpretation, shared by most Hungarian and many international scholars, Hungary's present high level of integration into international structures, rapidly evolved specialization pattern and spectacular shift from the old to the new economy guarantee the sustainability of its modernization achievements. These factors provide the foundations for further convergence on the developed economies. However, this interpretation is not devoid of some exaggeration.

Scrutiny of Hungary's specialization pattern shows that the *sustainability* of its modernization achievements is not guaranteed. The question to consider is why specialization in new economy-related goods should allow the economy to cope with the challenges imposed by the new economy.

Countries benefit strongly from efficiency-seeking investment in new-economy industries, in terms of market access, technology transfer to affiliates and capability

accumulation at them, and improved macroeconomic indicators like output, export and employment. However, the prospects offered by such specialization look meagre in the longer term, for two reasons.

1. The huge volume of efficiency-seeking investment goes into production, *e.g.* into the single tangible, 'mass' element of the new-economy type of activity. The production function has the lowest profitability of the various corporate functions. More profits are to be earned from pre-production activities, and still more, from post-production activities (Szalavetz, 2000a and 2000b). This accounts for the fact that increasing numbers of multinationals dealing traditionally with manufacturing have ceased to see production as their core business. Production is subject to intra-firm sourcing (it is rarely carried out at the multinational's headquarters), while some of it is out-sourced. The overall profitability of single-function production facilities in transforming economies is reduced, in most cases, by the fact that the price of intermediate products in intra-firm trade is determined less by market forces than by decisions within the multinational group.
2. The 1980s, and still more the 1990s, saw rapidly increasing shares of vertically integrated production in world production and consequently increasing shares of intra-firm trade (UNCTAD 1999 and 2000). However, the pace of such increases is bound to slow or even come to a halt. The transforming economies will not be propelled in the future by the present current of vertical, integration-based globalization. As the increase in vertical integration and intra-firm sourcing comes to a halt, it will give way to a network structure of related companies.

This hypothesis contradicts the tendency in the literature on international trade to extrapolate from present trends a further increase in export-oriented FDI and global vertical integration of production and in the share of intra-firm trade in total world trade.<sup>4</sup> This notable consensus among analysts of FDI and world trade trends is not shared by those concerned with organizational economics, who have long predicted that vertical integration will diminish in importance over time, in favour of new, not necessarily equity-based forms of integration (Johnston and Lawrence, 1988; Dess *et al.*, 1995; Ashkenas, 1995).<sup>5</sup> Their arguments rest on the characteristics of the business model emerging out of the new economy, where material elements – material inputs and the value added by physical processing activity – form a declining proportion of the total value of a product. The value lies in intangible elements: the novelty of the idea behind the product, its R and D-intensity, its brand name, the accompanying services *etc.* This new business model, underlining new ways of creating value and giving a predominant role to intangibles,<sup>6</sup> is a less often mentioned meaning of ‘new economy’, but one highly relevant to the topic in question.<sup>7</sup>

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<sup>4</sup> A comprehensive review of the related literature appears in Rojec (2000). See also UNCTAD (2000).

<sup>5</sup> Those considering the impact of ICT and analysing whether it revolutionizes ‘the economic order’ should keep in mind Mokyr’s reasoning: ‘A real industrial revolution consists not just of technological innovations but of such innovations that make an impact at the level of industrial organization’ (Mokyr, 1997, pp. 37). The author, unlike sceptics (Gordon, 2000), is persuaded that new-economy phenomena will greatly alter the world of business and economics.

<sup>6</sup> See Boulton *et al.* (2000) and Lev (2001) for details.

<sup>7</sup> The first and commonest meaning of new economy, is the ‘death of the business cycle’, a reference to the unusually long upswing in the US economy, accompanied by indicators hinting at an ‘end to conventional economic theses’. Many publications tackle this macroeconomic issue and the question of whether there are any lessons from it applicable to other economies. See Stiroh (1999) for a review of the lit-

Erosion of the value contribution of material inputs brings a decline in the importance of the efficiency gains available from economizing on direct production costs, by relocating simple processing tasks to low-wage countries. This decline results from technology. It makes less sense to relocate to such countries if routine physical and mental tasks are being taken over by intelligent machines.

The benefits theoretically available from efficiency-seeking investments are also shrinking, because of changes in the strategic orientation of manufacturers. Instead of the traditional ‘market-share’ strategies of the old business model (gaining market share from competitors), the most promising approach according to the business model of the new economy is to add new sources of value. Global manufacturers such as the Fortune 100 blue-chip corporations have long redefined their value chain to include service activities like financing, technical support, maintenance and upgrading activities, and increased the share of services in their total income. The service share of the total income of traditional manufacturers like GE or IBM has reached a level where it becomes difficult to class them as manufacturing companies any more.

In brief, the new economy has given rise to a new business model, in which the features of international trade are also bound to change. Instead of vertically integrated multinationals carrying out internal transactions, increasing their efficiency by breaking up the value chain and optimizing the spatial differences of factor costs, the main competing actors will become hori-

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erature. Another meaning of new economy is the increased role of ICT in the world economy and the expansion of ICT-producing sectors. This is the sense in which the term new economy becomes more or less applicable to Hungary’s situation.

zontal networks of related firms.<sup>8</sup> Instead of the present prevalence of two major types of trade – inter-industry and intra-industry – the share of trade among related companies within world trade will increase spectacularly. These companies are not necessarily tied by equity links. Although they are strategic suppliers to each other, they are not necessarily in the same aggregate industry. (The network is a broader category than simply the cluster of component suppliers.) Some companies in the network carry out business services and some specialize in specific corporate functions.<sup>9</sup> In a sense, trade among them can be labelled intra-industry, since the concept of ‘industry’ in the new business model has to be redefined in a similar way as the concept of manufacturing does. Instead of manufacturing meaning a manufacturer’s traditional value-chain role of producing and selling things, it comes to refer to a complex ‘systematic process of production’ (Panchak, 1998). Similarly, the meaning of the individual manufacturing industries comes to encompass a complex network of related industries and services.

I refer to this third type of trade, among related companies, as ‘intra-related-industries trade’ (IRIT). The increase in IRIT derives from the increasing tradability of services. The share of IRIT in world trade is

bound to increase at the expense of intra-firm trade, because IRIT involves relations that are less of an equity type.

If this hypothesis is supported by empirical evidence, it is high time to ponder how to diversify the growth strategies of the transition economies, which are based at present exclusively on trying to attract the maximum amount of FDI into technology-intensive (scale-intensive, new-economy) industries.

Of course, technological, structural and strategy changes in the new business model of the new economy do not point to the end of traditional manufacturing, but a metamorphosis of it. Industrial policy-makers in transforming economies have to bear in mind this metamorphosis when elaborating long-term strategies. Although the progress of this metamorphosis is geographically uneven and the transforming economies should expect a considerable time lag before its effects are felt, preparatory steps need to be taken now.

Take the example of Ireland, the country recently described as ‘the most outstanding example of material success (*sic*) in the rich world.’<sup>10</sup> The country’s GDP has soared at roughly 8 per cent a year for the last five years, with unemployment falling from a mid-1990s peak of nearly 20 per cent to about 4 per cent today (Mudd, 2000; *Quarterly Economic Commentary*, December 2000). The primary reason of this spectacular performance is the fact that investors are pouring billions of dollars into new-economy industries. Does the example contradict all the caveats and arguments listed in this paper? The answer is yes and no.

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<sup>8</sup> Horizontal refers here not only to lack of hierarchical coordination (Dunning, 1995), but also to external transactions (as opposed to the internal ones typical of multinational organizations). Dunning, in his seminal book (1997), agrees with the exponents of organizational economics (see Notes 6 and 13). He points to the blurring ownership boundaries of multinationals, due to their increasing interaction and collaboration with other firms.

<sup>9</sup> Corporate and functional services like financial services, logistics, technical support services, maintenance, software-systems development and operations, design, auditing, advertising, human resources and Internet services are increasingly out-sourced. So are the key phases of new-product introduction and advanced development (Quinn, 2000).

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<sup>10</sup> Lloyd, John, ‘The Country That Said Yes. Ireland’s Economic Performance Since Joining the European Union’, *New Statesman*, October 9, 2000, p. 15.

It does in terms of providing evidence for sustained economic success based on Ireland's specialization in high-tech manufacturing. This specialization could initially be described by the old business model: vertically integrated suppliers operating in global industries, assembly-type work, and low unit value added, but high aggregate value, because of the high and increasing magnitude of output. On the other hand, it does not contradict the arguments because Irish industrial policy has contributed with spectacular success to the gear-change (the introduction of new-business-model characteristics). Economic policy has promoted a proliferation of business services. (The country has a key position in the global software industry.) It has tried to encourage the location of R and D tasks to the local manufacturing subsidiaries of multinationals. According to the medium-term review of the ESRI (Duffy *et al.*, 1999), there will be a gradual shift in the engine of growth over the next ten years, from high-tech manufacturing to market services.

#### 4. SUPERFICIAL AND DEEP INTEGRATION

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The conclusion is that a shift from the old to the new economy, if it relates only to the specialization pattern of production, is insufficient to sustain the modernization results. Integration into international economic structures should also acquire advanced, new-business-model characteristics. Successful integration based on the old business model (becoming incorporated in the vertically integrated structures of manufacturing multinationals' production activity) may reap spectacular benefits, but it remains a superficial integration. The fact that it is based on new-economy industries and the

products assembled locally are high-tech may disguise the old-business-model characteristics of such integration. However, policy-makers and economic analysts should not nurture illusions. In an era when hierarchical coordination has declining importance (there is a diminution in the net benefits of internalized markets), this integration is still subject to strict hierarchical control, which makes it vulnerable. The industries in question are scale-intensive, intermediate goods-intensive and highly concentrated. The internationalization strategy of investors in these industries is marked by vertical integration, involving a search for the benefit of factor-cost differentials and economies of scale. In brief, old-business-model characteristics manifest themselves in every feature of such integration.

Integration into the vertical structures of multinationals has been an important anchor for industrial modernization in the transforming economies. Nevertheless, it should be seen as a first step, to be followed by further dynamic upgrading of the integration pattern. Local subsidiaries in transforming economies show patterns of deep integration only where their activities encompass elements of the new economy's new business model, *i.e.* if their value added is not restricted to tangibles, but has a due share of intangibles as well.

Policy measures that promote such upgrading include support for specialization on business services as well as industrial 'tertiarization' (shifting some activity by leading local manufacturers from goods production to non-physical activities such as services and software development).

Furthermore, industrial policy needs to promote enlargement of the range of corporate functions performed by local subsidiaries (Szalavetz, 2000b). In a period when manufacturing has become a systemic mode

of production, instead of a purely physical production process, single-function production facilities in transforming economies can only sustain their position in the multinational organization by acquiring additional corporate functions.<sup>11</sup> Policy should promote capability accumulation at local production facilities, enabling them to participate as fully-fledged actors (Birkinshaw, 1996; Birkinshaw and Hood, 1998) in the networked systemic process of production.

New-economy phenomena, the decline of hierarchy and the increasing scope for horizontal organization of activities<sup>12</sup> present tremendous opportunities at the micro level (for manufacturers operating in peripheral markets) and macro level (in terms of catching up). Without a circumspect enabling policy, the opportunities may be missed (Johnston, 2000; Visco, 2000).

## 5. THE NEW ECONOMY AND REGIONAL-DEVELOPMENT POLICY

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One of the salient features of structural change in advanced and in transition economies is spatial concentration of economic activity. The first descriptions of this self-instigating process of industrial clustering referred to clusters of certain renewed traditional industries.<sup>13</sup> In the new econom-

ics of competition (Porter, 1998), when policy-makers consider industrial clusters important enablers of national growth and international competitiveness, clusters typically encompass high-tech industries (and financial and business services).

Examining TNCs' behaviour as exemplified by choice of location, Nachum (2000) expanded the concept of clustering, saying it was applicable also to transnationals, not just to small, indigenous firms. In fact, globalization of industry means that clustering and the emergence of industrial districts are spearheaded by multinational subsidiaries. The process of spatial concentration has recently accelerated considerably, which may partly explain the remarkable stability of the regional inequalities throughout Europe<sup>14</sup> and the widening regional disparities in transition economies.

Empirical experience in both the transition and the advanced economies belies the hypothesis that accelerating national growth diminishes regional disparities.<sup>15</sup> Growth is particularly concentrated in Hungary. Concentration manifests itself not only in the spatial pattern, but in the fact that a couple of multinationals account for a remarkably high share of output and exports.

Measured by number of firms, the share of foreign-owned companies<sup>16</sup> in the

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<sup>11</sup> Examples of such functions are procurement, logistics, R and D, production-related software development, product-related accompanying services (e.g. technical support services), marketing, sales *etc.*

<sup>12</sup> See Ashkenas (1995) and Dess *et al.* (1995) on boundary-less organizations, as vertical boundaries between levels and ranks, horizontal boundaries between functions and disciplines, external boundaries between firms and suppliers, and geographical boundaries between locations, cultures, and markets grow increasingly permeable.

<sup>13</sup> Examples are clothing or shoemaking. See Marshall (1920).

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<sup>14</sup> In an EIB Prize-winning essay, Martin (1999) was struck by the weak achievements of the huge amount of regional transfers within the European Union. (Sums devoted to regional policy account for a third of the Community budget, second only to the Common Agricultural Policy), yet inequalities among European regions proved persistent and the process of convergence remarkably slow.

<sup>15</sup> See the European Investment Bank Papers devoted to this (Vol. 5, Nos. 1 and 2).

<sup>16</sup> By foreign-owned is meant companies in majority or full foreign ownership. The data in this paragraph come from Zoltán Pitti and GKI Economic Research Co., Budapest.

Hungarian economy amounted to 9.8 per cent in 1999. Their share of gross value added, however, was 52.4 per cent, of exports 82 per cent and of fixed investment an astonishing 88.2 per cent.

Concentration of exports is best measured by the share of the ten most important export products within total exports. The data below refer to Hungarian exports to the EU 15, which in 1999 accounted for 76.2 per cent of total exports. At SITC 5-digit level, the share of the ten main products was 35.64 per cent in Hungary in 1998.<sup>17</sup> For comparison, here are the figures for some other transition countries: Poland 21.66 per cent, Slovenia 28.08 per cent, the Czech Republic 22.33 per cent and Estonia 39.71 per cent (Éltető, 2000b).

Most of these companies operate in high-tech and new-economy industries<sup>18</sup> clustered in a couple of industrial districts of Western Hungary.

The dark side of this concentrated pattern of growth is the significant increase of regional disparities, with ailing regions facing deteriorating prospects of catching up.<sup>19</sup>

The logical reaction of policy-makers has been to ground regional-development strategy on promoting the inflow of FDI and an FDI-based shift from the old to the new economy, also in backward regions. This

section seeks to find out if this policy approach is correct and feasible.

The approach seems correct in the context of the dominant role of foreign owned companies in the Hungarian economy and the assumption (with some risk of exaggeration) that foreign investors are responsible for ensuring that the economy functions at all. According to Markusen and Venables (1999), FDI contributes to structural change in two senses. (i) It promotes structural upgrading of existing industries by accelerating exit from non-competitive segments and bringing higher growth potential into segments. (ii) It contributes to diversification, by introducing new manufacturing and service activities.

The beneficial influence that the prosperous, rapidly expanding local subsidiaries of multinationals exert on their location's economic development is obvious and to some extent quantifiable. Let us denote the quality of a region (its position along the continuum between a depressed, crisis region and a high-growth region) by the hypothetical flexibility indicator (F). FDI's impact on the flexibility of a region depends on the quantity and the quality characteristics of FDI inflows. The quantity effect is made up of two factors: *growth* (G) – e.g. FDI contributes to the resumption of growth<sup>20</sup> and the increase of employment – and *diversification* – quantified by the share of new activities ( $D_{NA}$ ). The quality effect of FDI includes its *modernization effect*, measured in local value added (VA), the *network effect* (N) of newly founded subsidiaries, and the agglomeration effect (A) of these. Value added is a composite indicator that encompasses quality and quantity elements. The

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<sup>17</sup> As a percentage of total exports to the EU.

<sup>18</sup> Typical Hungarian exports include (in decreasing order of importance) reciprocating piston engines, storage units for data processing, video recording or reproducing apparatus, motor vehicles for transport of persons, parts of automatic data processing machines, magnetic or optical readers, television receivers, colour or sound and video recorders *etc.* (Éltető, 2000b).

<sup>19</sup> Regional difference (measured in GDP/capita for the richest NUTS III region divided by the poorest, in per cent) increased from 304.4 in 1994 to 355.5 by 1998 (Rechnitzer, 2000).

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<sup>20</sup> Extra, restructuring-induced operational efficiency is in principle a quality effect, but the resulting competitiveness increase is quantifiable from the growth indicator.

quality effect is best reflected by the unit value added of the activities. It will be seen later that low unit value added is usually concealed by high quantity of output, which results in a high total value added. By network effect is meant the extent to which foreign investment enterprises (FIEs) rearrange their upstream and downstream business relations in a period of time and become embedded within the region. The network effect of FIEs is closely related to their agglomeration effect, by which is meant the well-known effect of encouraging related activities to locate in their neighbourhood.<sup>21</sup>

All these factors can be encompassed in the equation  $F = f(G, D_{NA}, VA, N, A)$ .

The issue here, however, is not quantification of the benefits of FDI. The question to consider is whether location of new-economy industries can best launch renewal in ailing regions, or whether investment in other, less technology-intensive (more easily absorbed) industries should be promoted instead.

NE-industries have a spectacular impact on the G-element of the above equation. These industries are scale-intensive in character and highly concentrated over the world. The output of local production facilities is not designed to supply the domestic market, but to cater for the worldwide markets of the multinational owner. The volume of output is usually large enough to exert a spectacular influence on regional GDP. Although, as stated in the first section of this paper, such industries are capital and technology-intensive, the activity at local production facilities is labour-intensive. This gives a significant boost to local employment. The other conclusion to be drawn

from the simple, labour-intensive character of the activity is that irrespective of the high technological content of the products, new-economy industries are well absorbed, even in ailing regions with a relatively low level of average education attainment. Workers only need three or four weeks' training for their simple assembly tasks.

The impact of new-economy industries on diversification (the D-element in the above equation) is self-evident. Their impact is less clear in the case of value added (VA). Although the total value added in regions where establishments of new-economy industries are located increases considerably, unit value added is usually very low. If measured by the unit value-added indicator, the quality effect of investment in new-economy industries is marginal in the first run. (Later, as a result of their accumulation of technological capabilities, firms may engage in more sophisticated production tasks and gradually mount the technology ladder. Thereby, their unit value added also increases.)

The network effect (N) of new-economy industries is usually weak. Clusters encompassing new-economy industries (especially in transition economies) are a special case. One key feature of clustering cannot apply to them. Only the spatial concentration of specific industries applies, not the intense vertical and horizontal linkages among the actors. According to Markusen's classification (1996), these clusters are satellite industrial platforms with minimal intra-district trade among buyers and suppliers. The linkages of the key actors tend to be external (between the local subsidiary and the parent company).

The agglomeration effect of new-economy industries is especially strong in the sense that their representatives tend to

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<sup>21</sup> This is referred to as the *multiplier effect* of FDI in Csáki *et al.* (1996).

locate close to each other. Depressed regions with little industrial activity or declining regions specialized in traditional industries are handicapped in attracting greenfield investment from new-economy industries.

To sum up, although the quality effect of new-economy industries is ambiguous, their quantity effect on development of the regions where their representatives are concentrated is particularly strong. If regional development 'seed projects' are successful in encouraging pioneer representatives of these industries to locate, there is a chance of the emergence of a virtuous circle: other representatives will follow suit and the agglomeration effect of these industries apply.

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