Abstract
The paper discusses the assumptions of the neoclassical model underpinning the transition of Polish economy. It points at its weaknesses that may be revealed at the theoretical level and confronts it with the macroeconomic performance of the Polish economy after introduction of the market economy. Than it addresses the recommendations for the modern knowledge-based development, especially related to the advantages of new entry of firms and innovation as its outcome, and confronts them with the real determinants of behaviour of the different entrants to the Polish market. It indicates what was missing for creation to replace destruction: sufficient access to external capital and to R&D services in the case of SME, strategic decisions in the case of FDI, and favourable institutional environment and cooperative attitudes for both

Key words: economic models; transition; innovation; enterprise behaviour

JEL codes: E13; L2; O33; P27

* Warsaw School of Economics and European Commission; this contribution expresses exclusively the personal opinion of its author and does not, in any case, bind the European Commission
1. Introduction

The project of transition effectively applied in Poland since 1989 (so called “Balcerowicz plan”, by the way not conform to that agreed upon at the Round Table) was based on a number of assumptions, or rather convictions, namely (Lipton and Sachs, 1990) (Lipton and al. 1990):

- free market with freely negotiated prices, hard budget constraint (subsidies eliminated) and competition will solve all the problems, it will automatically select viable firms (but: technical and managerial temporary assistance for State firms is required for some limited time); regulation is just a burden
- if internal competition is insufficient, large import opening is necessary
- private governance is always better than public one – irrespectively of the market structure (the principal deficiencies of public firms being tendencies to overinvestment and excessive wages)
- FDI are always generators of industrial modernization and technological spill-over
- destruction is always creative, small business will flourish by itself
- labour market should be the least regulated possible
- welfare will come by itself, sooner or later; if recession and unemployment will take place, it will be only temporary
- market and competition will automatically assure external competitiveness.

The actions of liberalization and privatization were supposed to assure both attaining automatic allocation-effective equilibria and to provide for growth and external competitiveness.

In the meantime the European economies were confronted with the challenge of new technology and for this end a modified model was proposed, based on liberal assumptions but pointing at particular industrial structures (with easy entry, flexible labour markets) as the most favourable. As in particular those features (massive entry of SME and of FDI, protection of workers decreasing in fact – even if not necessarily by law) were characteristic for the economies undergoing transition to the market economy, they may be a good case to analyze the real consequences of the theoretical models.

The objective of the paper is to show that most of the above indicated outcomes that the project of transition had to provide were not reached and that the properties of economic
system and its evolution that the project did not take into account were responsible for that. In particular, I will point at the obstacles the new entrants to the market were confronted with and the degree to which it deteriorated their propensity to engage in advanced technology.

II. Theoretical models and their discussion

In the basic neoclassical model of an economy the firm is governed by individual entrepreneur, who is totally utilitarian (individual profit oriented) and rational individual. He thus purchases the adequate quantities of the services of labour, capital and land and intermediate goods and decides to produce such a quantity of output to obtain maximum profit. All the transactions on the market take place between the owners of factors and goods, of equal power, and the information about preferences and scarcity is transmitted by competitive and instantaneously adjusting prices. Their changes assure adaptation to changing technological conditions. This mechanism assures both optimal use of factors and their optimal allocation. The only role of the state is to assure enforcement of property rights (Aoki, 2001, ch.15).

Already in his early critics Murrell (1991) pointed at insufficiencies of pure neoclassical model as a basis to explain both the effectiveness of different market economies and the deficiencies of planned economies with this respect. He indicated the features studied by contemporary economics itself. The first of his arguments was that decentralized information is usually incomplete and costly to obtain. Information asymmetry violates the principal assumption of transparency the neoclassical economics is built on. The second argument dealt with cost and riskiness of entry and exit to the market. Lack of transparency of the markets and unpredictability of behaviour of economic agents makes entry and exit decisions bounded rational and deteriorates instantaneous adjustment assumed by classical theory. Murrell indicates also an example of numerous market failures, namely this of a biased trade-off between product variety and economies of scale, coming out from inability to match the micro- and macroeconomic equilibria. Finally, he addresses distributional effects as private welfare gains under information decentralization, biasing allocation decisions.

Numerous were the other problems overlooked by the neoclassical economics that Murrell did not point at. This theory in principle does not take into account any particular impact of institutions governing the relations between agents, even ignores the fact that institutional settings are differentiated among market economies. It does not take into account differentiated industrial structures, especially networks of relations and strategic behaviour, so
frequent in contemporary business world. It supposes that contractual relations between the agents (in principle of equal power) are non-frictional contrary to already developed transaction cost theory. It assumes rational behaviour of agents dissimulating the fact that it may be considerably biased both by individual preferences and by perception errors (Camerer and Loewenstein, 2003). And, least but not last, it is basically static theory underestimating the evolution of processes of adjustment, development, innovation.

It comes out very clearly that the prescriptions of neoclassical theory were particularly ill-suited to enlighten the leaders of transition from centrally planned system to market economy where the problem of adequate institutions (created out of scratch) was the key, industrial networks were stable and markets highly monopolized and agents had their habits and values not necessarily consistent with those of market economy. Nevertheless, such a pattern of market economy was adopted for Polish economy as the first laboratory of transition. The path of change was out of the agenda of discussions.

The spontaneous evolution of market economies itself has led in the direction substantially diverging from a theoretical neoclassical model of perfect competition. After the II WW in the world economy the firms grew to become corporations with dispersed shareholders managed by professionals. Managers are only partly (often superficially) controlled by the owners and to some degree by stock markets. The market became dominated by big providers and thus oligopolist structures replaced perfect competition. Prices are no more competitive, but subject to strategic considerations of the leading firms. Labour relations are influenced by trade unions and labour markets are no more flexible (Aoki, 2001, ch.15). Thus pure neoclassical model become obsolete at the time it was recommended to Polish policymakers.

The other point is that the new requirements of technology that the above described structure of economy was unable to supply put to the fore search for new (or modified) economic model. In fact, neoclassical model is aiming at technical and allocative efficiency, but unable to explain technological change and diffusion of innovation (Murrell 1991). Thus if it could address a part of deficiency of centrally planned economies (allocative inefficiency), the prospects of gaining external competitiveness, so important against globalization, were fuzzy. It was supposed that Polish economy will automatically become competitive and technologically advanced thanks to tight competition (also with import), massive entry especially of SME and automatic selection of the viable firms by the market, together with beneficial role of the FDI.
Recent empirical evidence indicated that in the leading economies extensive innovation relying on research, together with the changing competitive environment and the opportunities offered by ICT, leads to new forms of doing business, namely (Coyle and Quah, 2002, p.6):

- networked organizational form (as opposed to hierarchical and bureaucratic)
- services-core structure (vs. manufacturing-core)
- human and social capital as a source of value (vs. raw materials and physical capital)
- flexible organization of production (as opposed to mass production)
- innovation, quality, speed along the whole supply chain as a source of a competitive advantage (as opposed to reducing costs exclusively through economies of scale)
- alliance and collaboration, outsourcing as relations with other firms (go-it-alone previously)
- broad skills and adaptability (job-specific skills previously)
- lifelong learning (craft skill or degree, one-off requirement)
- collaborative workplace relations (adversarial before)
- employment marked by risk and opportunity (stable before).

In 2003 a Report of a team of European experts presided by André Sapir (Sapir et al., 2004) proposed a new model of inter-and intra-firm relations they were considering more suited for Knowledge based economy. The authors concluded that the slower growth in most EU countries was due to the inadequacy of the postwar model of growth (especially with regard to the institutions and policies shaping this model) and its poor adaptation to contemporary requirements. This growth model, efficient for a long time, was based on investment coupled with imitation and diffusion of technologies, along with standardization and large-scale production by giant firms, mostly thanks to the immigration of unqualified workers. This model exhausted its dynamism due to saturated demand and easy transfer to countries with lower labor costs.

The report underlined the importance of innovation for contemporary growth, which requires new organizational formulas, a lower level of vertical integration of firms, higher mobility and flexibility of labor markets, closer ties with financial markets, and stronger relations with higher education and research. The institutional environment should ensure the protection of property rights for innovative companies and an efficient system of education and research. Investment in research and innovation requires an efficient financial system
(especially venture capital) and reasonable interest rates. The market for goods should ensure competitive pressure under low entry costs, and the labor market should guarantee easy hiring of skilled employees.

One may find the relationship of this model with the Schupeterian idea of creative destruction. But contrary to Schumpeter’s approach the one adopted by the indicated above researchers is static, focusing on correlation of events and not on the process of evolution. It is also reductionist, focusing on agents as individuals, without taking into account interference between them (as cooperation, so important in contemporary advanced technologies). Thus the image of how innovation may emerge is significantly simplified.

It was supposed that high turnover of firms (entry and exit) underpins productivity effect both due to strengthening market pressure on incumbents and enhancing market structure (with low performance firms easily exiting) (Bartlesman et al., 2003). It was supposed also that entering firms are not only making pressure on incumbents to engage innovation, but they are also more disposed to take profit of radical innovation than incumbents (Henderson, 1993). Then the beneficial process of entry and exit was supposed connected to de-regulation of markets. Nevertheless, while the former relation could be confirmed for the European economies, both theoretical and empirical evidence on the outcomes of entry and exit for productivity and innovation are contradictory (Cincera and Galgau, 2005). It may be noted nevertheless, that the positive impact of entry on innovation is more probable in the sectors of advanced technologies. The research used the comparative econometric approach (static or across time) without looking into different profiles of entrants (SME and the others, e.g. FDI, incomparable), into the process of change and into the determinants of decisions of the firms.

In fact, the model designed for knowledge-based economy was looking back to the model of perfect competition with liberal regulation, only supplemented with the hope for stronger relations with research and education and for innovation somehow automatically coming to being. The considerations about the dynamics of process of creation at the level of industrial structures were missing.

The hypothesis of a leading role of entry in promotion of innovation is only one of those formulated by different currents of economics. The research fulfilled at the similar period to the publication of Sapir report and taking into account also innovation propensity of incumbent firms revealed much more complex conditioning of innovation (Aghion et al., 2005). Namely it was stated that the relationship between the degree of competition on a market and propensity to innovate has an inverted U shape. For high degree of competition
and similar costs (“neck to neck” situation) the firms “escaping competition” engage in step by step innovation. With competition weakening and relative differentiation of costs rewards to catching up with technology leader weaken and thus weakens also propensity to innovate. The model has been successfully tested on empirical data for the UK, and gives more realistic image of innovation processes but obviously does not describe all the actual factors of innovation in a firm.

One of the recommendation of Sapir model was promotion of entry of new players, especially SME. Some economists of more liberal orientation (as Polish Lisbon Forum) supposed that transition economies have more chance to develop highly innovative sectors able to catch up with efficiency of their American counterparts due to lower protectionism and more liberalization potentially allowing for entrepreneurship advantages (Kapas and Czegledi, 2006).

The objective of the present paper is to verify to what degree the conditions created in the Polish economy (radical change of industrial structure, massive entry of private firms) provided for growth (as indicated by neoclassical model) and innovation (according to the recent reformulation of this model). In the next section I will analyze the macroeconomic outcomes of transition in Poland, in particular as the technological level is concerned and then the demography and performance of Polish firms entering the market. I will then find out what besides liberalization and competition would be necessary to boost the innovativeness of companies.

### III. The experience of transition as the test of feasibility of models of economy

#### A. Evidence on macroeconomic level

At the macroeconomic level, in most countries under transition, this eventually produced a deep recession and a surge of unemployment (Kornai, 1993). Moreover, the destruction of the previous economic system was not followed by the creation of new, highly performing networks, especially as far as innovation is concerned (Berend, 2000). Hopes for a substantial spillover effect in the inflow of foreign direct investment were only partly fulfilled. In many cases, multinational companies established enclaves of development (Krifa and Vermeire, 1998) referred to as “cathedrals in the desert”. Contrary to expectations, the performance of privatized companies was adversely affected by insider control over governance (Aoki, 1995). In all these cases, institutional inadequacy was noted.
It has been discovered that, while formal institutions can be quickly introduced, the adjustment of companies takes much more time and may be distorted by an excessive attachment to the rules of the previous system (Murrell, 2005). Thus an essential problem of transition is the emergence of new informal rules capable of supporting the market, building trust and promoting respect for business obligations.

I will look more closely at the outcomes of transition in Poland first at macroeconomic and then microeconomic level and try to find out why the predictions of (traditional and modern) neoclassical economists as to efficient creation following destruction were not fully fulfilled.

In Poland, which was the first country in the region to embark on a transition to a market economy, the destruction of the old system was much more successful than the creation of a new properly working system. Especially early import liberalization had a highly destructive impact on internal economy. As a result, before long, the country faced a deep recession and persisting unemployment.

Table 1. Macroeconomic indicators for Poland, 1991-2006

<table>
<thead>
<tr>
<th>Year</th>
<th>GDP growth (preceding year = 100)</th>
<th>Unemployment rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991</td>
<td>93,0</td>
<td>12,2</td>
</tr>
<tr>
<td>1992</td>
<td>102,6</td>
<td>14,3</td>
</tr>
<tr>
<td>1993</td>
<td>103,8</td>
<td>16,4</td>
</tr>
<tr>
<td>1994</td>
<td>105,2</td>
<td>16,0</td>
</tr>
<tr>
<td>1995</td>
<td>107,0</td>
<td>14,9</td>
</tr>
<tr>
<td>1996</td>
<td>106,0</td>
<td>13,2</td>
</tr>
<tr>
<td>1997</td>
<td>106,8</td>
<td>10,3</td>
</tr>
<tr>
<td>1998</td>
<td>104,8</td>
<td>10,4</td>
</tr>
<tr>
<td>1999</td>
<td>104,1</td>
<td>13,1</td>
</tr>
<tr>
<td>2000</td>
<td>104,3</td>
<td>15,1</td>
</tr>
<tr>
<td>2001</td>
<td>101,2</td>
<td>17,5</td>
</tr>
<tr>
<td>2002</td>
<td>101,4</td>
<td>20,0</td>
</tr>
<tr>
<td>2003</td>
<td>103,9</td>
<td>20,0</td>
</tr>
<tr>
<td>2004</td>
<td>105,3</td>
<td>19,0</td>
</tr>
<tr>
<td>2005</td>
<td>103,6</td>
<td>17,6</td>
</tr>
<tr>
<td>2006</td>
<td>105,8</td>
<td>14,9</td>
</tr>
</tbody>
</table>

The principal feature indicating that destruction of existing industrial networks was not followed by sufficient creation of the new ones was high and persisting unemployment. Its growing in parallel with positive trend of the GDP might prove that inefficient use of labour which could be the case in the previous system was reduced (but for example research by Murrell (1991b) does not prove of lower technical efficiency of the firms in centrally planned economies), but also that labour in newly created private firms was overexploited often infringing Labour Code (Lissowska, 2006). Decline of unemployment in the end of the period (in July 2007 it amounted to 12.2%) was due rather to decline in the number of job seekers (choosing early retirement or emigrating) than to job creation (in 2005 it amounted to only a half of increase in unemployment\(^1\)).

If one can not deny the value of irreversibility of the switch to market economy thus created, the deficiencies due to the neglect of the dynamics of the process have been clearly revealed. The principal negative outcome was a pauperization of a big part of the society, especially victims of unemployment. The conviction that growth will automatically bring about job creation vanished in front of the strategies of private business to overcharge employees, especially when trade unions were weakening and labour regulations – tightening. It resulted in social discontent and finally in a victory of the populist parties, potentially endangering the sound development of the economy.

As to the reasons of deep drop in output and employment of previously existing firms that could not be counterbalanced by the entry of new, private units, we may quote the opinion of Murrell (2005, p.674) that poor performance of the firms was due to destruction of the old institutions while the new ones were not yet effective. He confirms that some firms were inventing informal rules, imperfect but viable, and try to join business associations or networks to survive external difficulties. The dangers of restructuring inter-firm relations, and in particular during privatization, were pointed at.

Just a few facts about the pace and coherence of institutional change in Poland with respect to functioning of enterprises. The first Privatization Act was adopted in Poland in 1990. At the time, a major part of the Civil Code still dated back to 1964 and was not adapted to market economy conditions. As there was an urgent need for basic regulations concerning the functioning of commercial companies, the Commercial Code of 1934 was revived (it was still in force, but was not used in practice due to the absence of commercial companies under

\(^1\) In 2005 unemployment increased by 600,000, new jobs created amounted to 328,400, but unemployment decreased by 825,000 (out of which only 404,000 found a job) (data from www.stat.gov.pl)
central planning). Thus companies, both those privatized and those privately owned and created from scratch, lacked a clear framework for their functioning, especially in terms of their cooperation with other businesses.

The objective and hope of transition was that the market economy thus created will be of high quality. If nobody can deny the dynamics of the Polish economy (GDP growth exceeding 5% in the recent years), it is certainly not due to technology advantage. According to data by Poland’s Central Statistical Office (Nauka i technika, 2005), in 1995-2004 the GDP share of R&D expenditure in Poland decreased from 0.65% to 0.58% and is now below the figures for European economies (2.55% in Germany and in Denmark, 2.19% in France, 4.27% in Sweden, 3.49% in Finland, 1.26% in Czech Republic, 0.95% in Hungary). Contrary to other European economies, the majority of expenditures come from State budget and not from industry sources. The share of innovative firms in 2004 was 39.0%, compared with an EU average of about 53%. Interestingly, the public sector revealed a higher share of innovative firms (47.6%) than the private sector (37.8%) (Nauka i technika, 2005, tab. 2.1). Thus the technological level of Polish economy rather deteriorated instead of ameliorate and was still substantially lagging after other European economies.

As to the outcomes of the application of new technologies, it is interesting to review the structure of sales by technology level (OECD classification). The share of low-technology sectors is still the highest, at 38.6%, while medium-low technology sectors account for 31.3%, medium-high for 25.6% and high-technology for 4.5%. The shares for technologies at different levels are not the same in the public and private sectors. The private sector is the most (41.2%) dominated by low technologies, though in foreign-owned companies the proportion of medium-low technology is the highest (42.5%). The public sector reveals a higher technology level than the private sector: medium-low technology sectors account for 56.8% of overall sales (Nauka i technika, 2005, table 4.1).

Poor performance of Polish economy in spite of liberalization and decentralization of decisions proves of insufficiency of neoclassical framework to explain it. Besides the omitted impact of institutions, the incompleteness of information amplifying risk of entry and exit was playing a role together with boundedness of decision rationality and the friction-wise character of industrial relations.

The deterioration of technological level of Polish economy took place in spite of genuine change in market structure: shift from domination of the public system to in majority private ownership, massive creation of new firms, strong inflow of FDI. All those features should, according to the neoclassical model, boost competition and enhance technology. Also
according to the recommendations of the modern model of Knowledge-oriented development frequency of new entrants, smaller scale of potentially flexible enterprises together with more flexible labour relations\textsuperscript{2} should promote creativity.

To some degree the deficiencies as to technological level of Polish economy were the outcome of the previous structure of the economy (monopolized and focused on outdated heavy industries) and of the destructing entry of better performing foreign agents (as FDI and import suppliers). Nevertheless the question is what conditions were missing, why the famous entrepreneurship and flexibility spirit of Polish start ups abroad could not develop better at home. The answer to this question may serve to the general discussion on the feasibility of the new, more flexible model of the European economy as a whole.

B. Evidence at microeconomic level

Since 1990 Polish economy is subject to intensive entry of new firms, especially small enterprises. As reported by (Sachs, Lipton 1990) in 1990 only 982 State owned enterprises (out of approximately 7,000) employed less than 100 persons and average employment per firm amounted to 1.132. This picture of domination by big firms quickly become obsolete due to the destruction of the public sector by privatization (often meaning selling out parts of enterprises) and creation of new units.

Nowadays the structure of Polish economy is radically different. It may be qualified as bi-polar with “missing middle”. While small units (up to 49 employees) constitute 64,6% of all the economic agents of more than 10 employees, the medium ones (50 – 249 employees) represent 29,2% and the big ones (of more than 249 employees) amount to 6,1%.

Out of the three groups, the medium-size units have the highest cost/revenue ratio (96,1% against 95,4% for small and 94,6% for big) meaning that their return rate is the lowest\textsuperscript{3}.

The other statistical source, taking also into account survey results for the micro-enterprises (up to 9 employees) gives obviously the different results in terms of number of units (small enterprises constitute 99,0% of the population, out of which 96,3% are the smallest) but the performance problem revealed is similar\textsuperscript{4}. In 2005 the ratio of costs to revenues amounted, similarly as indicated in the previously quoted source, to 90,6% for the

\textsuperscript{2} Formally, the changes in The Polish Labour Code favourable for business were postponed till early 2000’s due to political reasons (political role of the trade union Solidarity). Nevertheless, huge unemployment enabled substantial deterioration of the protection of the employees (work without any contract or on short-term contract, general non-respect of labour law) (Lissowska, 2006).

\textsuperscript{3} Bilansowe wyniki finansowe podmiotów gospodarczych w 2005 r., GUS, Warszawa, 2007, tab.34, p.102

\textsuperscript{4} Działalność przedsiębiorstw niefinansowych w 2005 r., GUS, Warszawa, 2007
small (thus being the most profitable), to 95,8% for the medium and to 94,6% for the big ones. The investment effort was nevertheless biased in opposite direction. Only 1 over 8 small enterprises invested in 2005 and investment expenditures amounted to 2,6% of revenues of this group. On the contrary, out of medium sized enterprises only 1 over 10 did not invest and their expenditures amounted to 4,3% of revenues. The highest was investment effort as compared to revenues in the biggest enterprises (6,3%) and almost all of them invested. The other data of interest is the degree of depreciation of machinery, this time the lowest in small enterprises(52,1%) compared to medium (60,5%) and big ones (62,2%). Thus the data reveal weak propensity to growth in the small firms and their younger age (which may be the outcome of their shorter survival time).

While frequency of the biggest firms is identical both in Poland and in EU-27 (0,2%), in Poland both medium and small but not micro (10-49) firms are scarcer (0,9% and 2,7% against 1,1% and 6,9% in the EU-27). On the opposite, the smallest firms (up to 9 employees) represent in Poland 96,3% and in the EU-27 92,1%. Labour productivity in EU-27 firms is systematically increasing with the size of firm from the smallest to the biggest, contrary to the relative weaker results of medium companies revealed for Poland.

It should thus be explained both why the group of small and medium sized enterprises is dominated by the smallest ones and then, why the medium firms are less profitable.

The other publication of Polish Statistical Office provides the outcome of the survey covering 5 years of the process of growth of small (mainly micro-size) enterprises. 2/3 of units created survived the first year of activity, and the bigger ones (legal persons and not belonging to physical persons, and employing labour force) had better chances. The starting of business was mainly out of own financial assets (for 83,9% of enterprises), rarely out of credit. Only 1 out of 3 units invested during the first year of activity. After 5 years this factor was nevertheless found decisive: 60,4% of firms investing during the first year survived against 38,2% of non-investing.

The general ratio of survival after 5 years was 28,1% and was higher for legal persons and those which employed labour force. The surviving firms increased in terms of employment, but their average size did not exceed 5 employees.

In the end of the period of analysis (2004) the intensity of starting new business decreased, but was still exceeding the number of businesses closing down (Wojnicka nad Klimczak, 2006).

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5 Warunki powstania i działania oraz perspektywy rozwojowe polskich przedsiębiorstw powstałych w latach 2001-2005, GUS, Warszawa, 2007
It comes out of the data that two factors were decisive for survival of the firm: initial conditions (size and endowment) and strategy. For most of the firms the objective was just short-term survival, thanks to exploiting market opportunities of the moment (the smallest firms were frequently changing sector of operations) and the easiest factors (cheap labour force). But only long-term strategy (investment and innovation) was really promising success. As principal barriers to growth the firms indicated insufficient demand and competitive pressure (33%). Frequency of supply-side barriers was relatively weak (18%) and shortage of financial resources was a principal one.

The smallest firms were the least involved in innovation (Wojnicka and Klimczak, 2006, pp. 77-81). In the years 2002-2004 it was the case of 17% of small Polish firms, of 40% of medium and of 67% of big. The percentages were growing but still lagged behind the figures for EU-15, where in 1994-96 44% of small firms introduced innovation, 58% of medium and 79% of big. Innovation consisted, in small as in majority of Polish firms, in process innovation connected to purchase of new equipment.

A study (Martin, 2004) shows that many small high-technology firms have emerged from universities and research centers. Most of them deal with information technologies as their core business. Undeniably, the high qualifications of Polish computer scientists and engineers, combined with moderate wages, play a significant role. Internationalized demand and advancement in communications promote access to global markets.

Other studies among small “success firms” (Sosnowska, 2005) prove that this success is often based on innovation. These companies, deprived of the possibility of pursuing their own research, apply generally known technologies and solutions, but thanks to the skills and imagination of their staff, they are capable of meeting the individual needs of their customers. Small innovative firms in Poland show features typical of the New Economy: concern for meeting the needs of individual customers, attention to high product quality, telecommunications infrastructure, and the proper selection of employees and their creativity.

The principal barriers to the development of high-technology firms were also subject to scrutiny (Martin, 2004). It has been confirmed that the main constraints were information and infrastructure shortcomings. In their case, these barriers were much more painful than for less technologically advanced firms, probably because for them information and contacts were more indispensable. Another barrier was a financial one, more painful than in the case of medium-technology firms. The market barrier (difficult access to the client, making it difficult to sell the product) was important as well. By contrast, internal barriers (posed by the production process and the labor force) were less important.
The small enterprises probably realized that innovation is a key factor of success but encountered substantial barriers. Three of them may be indicated as principal: financial constraints, institutional rigidities and managerial deficiencies.

The table below exhibits how innovation was financed in Polish firms of different size. Table 2. The sources of finance of innovation in firms of different size in Poland, 2000 and 2004 (%)

<table>
<thead>
<tr>
<th>Company size</th>
<th>Year</th>
<th>Own sources</th>
<th>Bank credits</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>2000</td>
<td>75,2</td>
<td>15,4</td>
<td>9,4</td>
</tr>
<tr>
<td></td>
<td>2004</td>
<td>78,0</td>
<td>16,3</td>
<td>5,7</td>
</tr>
<tr>
<td>Small</td>
<td>2000</td>
<td>60,7</td>
<td>29,9</td>
<td>9,4</td>
</tr>
<tr>
<td>enterprises</td>
<td>2004</td>
<td>65,0</td>
<td>27,3</td>
<td>7,7</td>
</tr>
<tr>
<td>Medium</td>
<td>2000</td>
<td>68,7</td>
<td>16,3</td>
<td>15,0</td>
</tr>
<tr>
<td>enterprises</td>
<td>2004</td>
<td>71,2</td>
<td>18,9</td>
<td>9,9</td>
</tr>
<tr>
<td>Big enterprises</td>
<td>2000</td>
<td>78,1</td>
<td>13,0</td>
<td>8,9</td>
</tr>
<tr>
<td></td>
<td>2004</td>
<td>81,1</td>
<td>11,5</td>
<td>7,4</td>
</tr>
</tbody>
</table>

Source: Wojnicka and Klimczak 2006, p.87

The data reveal that while internal sources were prevailing in all the firms, credits were much more important in smaller ones than in big. This observation apparently contradicts our previous research on crediting companies the conclusion of which was that banks ration lending to smaller firms (Akiba and Lissowska, 2005), (Akiba and Lissowska, 2006a), (Akiba and Lissowska, 2006b). In fact, there is no contradiction. The table should be read in parallel with the other proportion: that of general lower frequency of innovation in small firms. Quite obviously, the financial barrier exists for them. Having both difficult access to credit and limited internal sources they have to adjust their innovation projects to accessible external finance and thus limit them.

Distrust to creativity and change on the side of finance providers creates a barrier to growth for small business, common to Poland and to some degree to the other European countries and distinguishing them from the situation in the US (Scarpetta et al., 2002). As revealed by inquiries fulfilled in Polish banks, small business, new or undertaking something new is, especially in the eyes of finance providers, less worthy than a big firm, the strength of which is not its adaptive capacity, but market force and support it may eventually obtain from the State or from the network of the mother firm.
But also venture capital in Poland is reticent to finance projects of small firms. One reason why they avoid smaller firms is high monitoring costs in the case of dispersed projects. Another problem is that most funds do not wish to expose their owners to excessive risk and their staff lacks the necessary technical skills to assess new technologies. Other reasons why venture capital funds in Poland “fear” small technology-oriented firms include financial market regulations that discourage smaller firms from floating their shares and bonds on the stock exchange. This deprives them of cheaper funds and makes it difficult for venture capital funds to sell the shares of the companies at any time. As a result, venture capital funds in Poland are unable to invest all their resources (Goldberg, 2004, p. 49).

Recently a new trading platform (New Contact) has been opened by the Warsaw Stock Exchange to enable small firms to access financial markets. Nevertheless, broader financing of small firms by financial markets needs venture capital providers to develop more specific competences (monitoring of small, technology-oriented firms) and small firms to accept control sharing (e.g. admit venture capital representatives in the board).

One of the other factors of reticence of the firms to innovate is undeniably the quality of regulation. Absence of the clear project with this respect, initial de-regulation (“the best industrial policy is its absence” used to declared one of the first ministers of industry after transition), further centralization and tendency to broaden regulation, frequent and incoherent changes, created a wild and hostile environment for business. If it may suit big firms able to navigate in this legislative jungle (and even to manipulate it), the small ones need a reduced set of clear and stable rules. A delay to install “one shop” to register a new business, both in Poland and elsewhere in Europe, confirms a reticence of the States with this respect.

According to the report of the World Bank (Doing Business, 2007) Poland takes 75 place among 175 countries as to the indicator of ease of doing business. As to different areas, in starting a business its ranks 114, in dealing with licenses 146 (!), in employing workers 49, in registering property 86, in getting credit 65, in protecting investors 33, in paying taxes 71, in trading across borders 102, in enforcing contracts 112, in closing business 85. This profile is similar in other new EU Member States (except Estonia and Lithuania) and diverges considerably from EU-15 countries, ranking usually below 40 (with notable exceptions of Greece and Italy). In developed European economies both dealing with licenses and enforcing contracts is easier than in EU-10, but more difficult is employing workers. It thus contradicts a thesis sometimes advanced that post-transition economies are more liberal than established market economies and thus more welcoming technology-oriented firms (Kapas and Czegledi, 2006).
The characteristics of business environment seems related to weak innovation in Polish firms especially of small and medium size. For technology development and innovation, that are both complicated and costly, they need cooperation. Thus easy contract enforcement is a crucial condition. In the period 2002-2004 about 6.4% of Polish small and 20% of all medium firms had cooperation agreements. For the small firms it was less than for EU-15 small firms over the period 1994-1996 (8.4%) and only slightly more for medium-sized firms (16%). The proportion of big firms having cooperation agreements was substantially higher both for Poland (45%) and for EU-15 (50%). It seems that reticence to cooperate is a common feature of small firms both in Poland and in EU. It may be one of the factors disabling innovation. The fact that proportion of cooperating firms was substantially higher for firms doing innovation proves that it was important for this process.

The other factor of underdevelopment of Polish firms with respect to innovation is insufficiency of partners from research sector – some entities were shut down, other were unable to supply solution to industry. It was to some degree a result of privatization. The new owners of companies closed research centres or they were transformed into public units, evaluated as units doing basic research. Thus they lost interest in cooperation with the firms. As a substitute, the firms cooperated with consultancies (Wojnicka and Klimczak 2006). The difficulty to deal with licenses in Poland as revealed by the World Bank study on Doing Business is undeniably an additional obstacle to produce and apply innovation.

Under those circumstances those able to learn and adapt can hardly break the threshold of fighting for survival and those over this threshold are rather tempting to dominate the market than to follow the new opportunities. The reticence of public and regional administration to assure support to learning and adaptation is an additional difficulty.

The other entrant to the Polish market and potential source of technology drive and spill-over could be FDI. It is true, that after declared transition of previously centrally planned economies to the market system the flow of foreign direct investment in their direction raised considerably. Nevertheless, they were not necessarily channeling new technologies to the host countries and the degree of spill-over to the local firms was below expectations.

Poland, as the biggest country of the region, accumulated 93.3 billion USD till end 2005. This cumulated inflow amounted to 31.1% of its GDP and to 2440 USD per capita of population. Nevertheless, developed countries attracted much more investment (USD per inhabitant: Great Britain 13.660, France 9930, Germany 6132, Belgium 49230, Netherlands 28429, Spain 8610) (World Investment Report, UNCTAD 2006).
In many countries, multinational corporations are the principal driver of globalization and of research and technological progress. It should not be forgotten, that the manner of installation in the host country is subject to strategic considerations of the company. The intensive FDI inflows to Poland in the mid-1990s were mostly aimed at the exploitation of internal market and the of labor resources with products close to the end of their life cycle and basic technologies. It was the choice stemming from the existing conditions (unsaturated market of 39 million inhabitants, resources of relatively cheap labour force and some raw materials). Hope that the choice might be more favourable for internal Polish interests may be qualified as naïve.

The role of foreign capital firms in Polish foreign exchange is significant and the data give interesting insight into their strategies. In 2004 their revenues amounted to 41.6% of revenues of all the companies of more than 10 employees, but also to 57.4% of export and 61.4% of import (Chojna 2006). It should be mentioned, that export of FDI increased considerably only at the end of 1990’s when internal markets were saturated but high import propensity was noted since the beginning. The foreign companies imported especially intermediary goods. It proves that in fact they were reticent to co-operate with local firms, probably for fear of their reliability and for the quality of products they could obtain. Difficulty to enforce contracts revealed by the Doing Business ranking supports this hypothesis. The surveys of feelings and expectations of the managers of those firms did not cover this subject, only we may conclude that their negative assessment of the quality of legislation (incoherence and fuzziness) and riskiness of economic activity attenuated in 2004 as compared to the previous years (Marczewski 2006).

It is true, the financial ratios of FDI are better than for the total of companies operating in Poland. Also the technical level of their output (as measured in the terms of OECD classification) is better than for the total of private Polish companies. Nevertheless the expectations as to role of foreign investment as a principal channel of technology transfer (along with the transfer of resources for its application) has been considerably overestimated. While companies with foreign capital have won a considerable position in output (accounting for 38.1% of total sales in 2002), their participation in R&D finance in the same year constituted only 9.9% of the overall outlays of enterprises for this purpose. That same year the R&D expenditures of foreign affiliates constituted 78.5% of overall expenditures in Hungary, 43.4% in the Czech Republic and 22.6% in Slovakia (Main Science 2005, tab. 64). This means that the research efforts of foreign direct investors in Poland were substantially below those in other Central and Eastern European countries.
Still, the internal structure of FDIs’ R&D expenditures was advantageous: 32.1% of the outlays were dedicated to the aircraft sector, 15.8% were claimed by office machines, computers and electrical machinery; and 11.3% were concerned with pharmaceuticals. In these sectors, FDI outlays exceeded significantly those of Polish companies. Foreign investors visibly focused their research effort on advanced technologies. Even if some multinational companies (such as ABB, Delphi and Motorola) opened their research units in Poland, it was an exception rather than the rule (Stryjakiewicz, 2002). This policy was due to the inadequate industrial competencies of the local research network and the insufficient skills of local research managers.

The recent data prove that the new phenomena have arisen in the sector of firms with foreign capital in Poland (Burzyński 2006). Namely some of the foreign companies opened their service centres and even research centres in Poland. The majority of them was organized in the sectors of computers and telecommunication, software and pharmaceuticals. This, still very limited, tendency, was obviously an outcome of recognition of high qualifications of some Polish qualified staff, especially researchers and engineers. The recent emigration of qualified employees to the places they are better rewarded may block this evolution (foreign employers already complain about insufficiency of qualified labour force).

While research in Poland seems not to be the choice of multinationals, their efforts to intensify innovation were more evident. Outlays for this purpose by companies with foreign capital constituted 39.6% of overall innovation outlays in industrial enterprises. Outlays on (mainly imported) machinery and equipment dominated. Outlays on training programs were higher than in other companies, while spending on the purchase of new technologies remained limited (Witkowska, 2005). The local branches of foreign companies developed their technologies, mainly by enhancing their production processes and applying information technologies; but developing these technologies in Poland was not their goal.

The spillover effect was limited as far as the intensity of relations with local producers was concerned, at least in the initial stage of implantation. Still, companies with foreign capital in Poland have changed their strategies over the past five years. Market saturation and recession have forced them to look for export markets. To meet competition abroad, they have improved their technologies and products.

The factors of moderate involvement of FDI in modern technologies in Poland are different from those relevant for the other new entrants, SME. Contrary to the former, they do not suffer from lack of capital (at least bigger-sized ones). The factor of difficult institutional environment and difficulties of cooperation play a role to some extent (but, due to their size,
FDI are less dependent on cooperation in innovation). The factor specific to multinational FDI is that of their strategic considerations, involving factors of much broader scale in decision on what kind of activities to undertake in a given country. It makes their decision less sensitive in positive sense to regulatory measures in individual country (but potentially more sensitive in negative sense – due to broader choice).

III. Conclusion

The macroeconomic indicators for Polish economy prove that even now, 18 years after transition started, destruction of existing enterprises and their networks has not been counterbalanced by creation even in the terms of employment. Undeniably speed of liberalization together with opening to import implied such a scope of destruction, with a well negative consequences for survival of viable firms and creation of new ones (e.g. because of sharp competition of foreign goods and disappearance of cooperating units - research units particularly endangered).

Macroeconomic indicators prove also that the quality of growth, in terms of innovation and technical level of offer, did not improve and left Polish economy lagging considerably behind its European partners. The experiences of Polish transition prove of the difficulties to spontaneously develop flexible and knowledge based economy.

All this took place in spite of massive entry of indigenous small firms and also of foreign investors. According to the thesis of economists, it should imply rise in productivity and drive to innovation. The evidence of Polish industrial structures enable thus to verify the theoretical approach, which is neglecting the reality of economic agents: both initial conditions and specificities of their strategies.

The evolution of Polish industrial structures is obviously atypical. They had to undergo not only almost total restructuring, but as well adjust to completely new institutional environment. The entry of new units was not driven by innovation creation, but by willingness to join visibly incomplete industrial structure. Organizational changes were not marginal, but overwhelming. This suits neither to the assumptions of Schumpeterian creative destruction, nor to the conditions of knowledge-based economies. Thus some conclusions can not be generalized. Nevertheless some phenomena seem to be common to European economies.

Poland abounded in creation of small business. Nevertheless SME visibly encountered strong barriers to grow. This is revealed by a strong overrepresentation of business of micro
size and relative weakness of medium-sized firms (especially in the terms of performance). Their survival and success depended on external conditions and internal strategies of the firms. The first factor of success was initial size of the enterprise, in terms of employment and capital (firms with external employment were found potentially much more successful). This interfered with the choices and strategies of firms. It was found that investing (and undertaking innovation) was a substantial condition of success. This may confirm the thesis of Aghion et al. (2005) about innovation motivated by escaping competition. But such a strategy was the case of only a minority of small enterprises. Most of them were fighting for survival, frequently changing sector of operations instead of following a long-term strategy.

It seems that two factors were hampering innovation of small firms. First was difficult access to external finance. This was implied by risk aversion and limited competencies on both sides (of finance providers and of potential borrowers). But the other reason, probably relevant not only for the small start-ups, but as well for bigger firms, were institutional deficiencies. It should be underlined that nowadays it is an illusion to qualify Polish economy as liberal. Under incoherent and unclear legislation and the willingness of public administration to interfere it is a particularly hostile environment for business. It is true, effective labour relations are less constraining than in Western Europe, but it does not seem to stimulate high technology activities. On the other hand, difficulty to enforce contracts and to deal with licenses discourages form cooperation. For small business it is sine qua non condition to engage in innovation. Difficulty with this respect (and, additionally, scarcity of offer emanating from research organizations) necessarily adversely affects creativity of Polish small business.

The disillusion as to the role of the other entrant to Polish market, FDI, has quite different reasons. Those firms are not fighting for survival, they formulate their strategy according to their conditions and considerations, often on world-wide scale and not according to the wishes of the host country. It should not be forgotten, that they compete on international and not local scale. Thus they may engage in leading technology, but not necessarily in all their localizations. They are insensitive to differences in access to capital (they may transfer it from one branch to another), they are more sensitive to local conditions, but one may not predict any of their decisions barely on this basis.

Thus drawing simply a relation between the frequency of entry and exit or degree of competition and propensity to innovate without taking into consideration who are the entrants as compared to incumbents, what they wish and can do does not enlighten very much about the process of creation and seeking novelty. A reliable research on this topic should take into
account differentiation between the agents and interference between their strategies and external conditions, the institutional environment in the broadest sense being one of the most important. Besides, it seems that liberalization may be a factor enabling innovation in the case of big firms organizing their cooperative networks themselves, but to a lesser degree in the case of small firms. The latter need simple rules, but they may require a support in cooperating among themselves and with research sectors (at least, they need some externally organized research to contract specific works or results).
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