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IDENTIFYING CHALLENGES AND DEVELOPING VISIONS

TECHNOLOGY FORESIGHT IN HUNGARY

ATTILA HAVAS

Institute of Economics
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Technology Foresight in Hungary

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Paper presented at **International Forum on National Visions and Strategies** 20–22 May 2002, Seoul organised by KDI's School of Public Policy and Management

ISSN 1419-6328
ISBN 963 9321 55 9

Published by the Institute of Economics Hungarian Academy of Sciences, Budapest, 2002.
With financial support of the Hungarian Economic Foundation

The Publications of the Institute of Economics

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IDENTIFYING CHALLENGES AND DEVELOPING VISIONS
TECHNOLOGY FORESIGHT IN HUNGARY

BY ATTILA HAVAS

Abstract

TEP, the Hungarian Technology Foresight Programme, was launched in 1997, as the first one in Central and Eastern Europe, to provide inputs to a national strategy by identifying socio-economic challenges and developing broad visions for the future. Specifically, it was aimed at analysing Hungary's current strengths and weaknesses, developing scenarios (visions) and formulating policy proposals to improve quality of life and the long-term international competitiveness.

This presentation first briefly defines the concept and methods of (technology) foresight, and highlights some reasons why it is a useful policy tool, followed by a brief account of the objectives and methods of TEP. Then, summarising the results, Sections 3 and 4 provide an overview of the transition process (institutional changes as well as economic developments) and the current socio-economic challenges, respectively. Changing the time horizon, 3 long-term macro scenarios are discussed in Section 5, together with policy recommendations developed by TEP so as to achieve the most desirable – but still feasible – vision. Section 6 summarises the results of the dissemination and implementation phase of TEP. Finally, the concluding section highlights the benefits of foresight to assist decision-makers; some general difficulties concerning its design, methodologies and implementation of its results; as well as specific Hungarian problems, due to the legacy of planning.

HAVAS ATTILA

STRATÉGIAI KIHÍVÁSOK, JÖVŐKÉPEK ÉS AJÁNLÁSOK
A MAGYAR TCHNOLÓGIAI ELŐRETEKINTÉSI PROGRAM EREDMÉNYEI

Összefoglaló

A magyar Technológiai Előretekintési Programot (TEP) 1997-ben indította az Országos Műszaki Fejlesztési Bizottság, hogy a program eredményeivel hozzájáruljon a sikeres felzárkózási stratégia kidolgozásához. A TEP a fejlett országokban is újnak számító, Közép- és Kelet-Európában pedig először alkalmazott elemzési eszközöket próbált ki, több ezer szakértőt vont be a munkába. Kutatók, gazdasági és államigazgatási szakemberek elemezték az életminőség és a versenyképesség javításához legfontosabbnak tartott területek helyzetét. A munkacsoportok több, egymástól minőségileg eltérő jövőképet vázoltak fel, és a legkedvezőbbnek ítélt jövőkép megvalósításához ajánlásokat fogalmaztak meg.

A tanulmány először röviden összefoglalja az előretekintés (foresight), mint döntés-előkészítési módszer elméleti hátterét, alkalmazásának indokait, majd a TEP céljait és módszereit. Ezt követően áttekinti a piacgazdasági átalakulás folyamatát (szervezeti-intézményi változások, gazdasági eredmények), és kiemeli a még megoldásra váró legfontosabb társadalmi-gazdasági feladatokat. A TEP 3, hosszú távú jövőképét és ezek közül a résztvevők által legkedvezőbbnek tartott jövőkép megvalósítását szolgáló ajánlásokat ismerteti a következő fejezet. A TEP nem fejeződött be a jelentések elkészítésével; az elemzéssel egyenrangú feladat volt a jövőképek és ajánlások ismertetése, megvitatása, ezért a tanulmány kitér ennek a szakasznak a tanulságaira, eredményeire is. A záró fejezet néhány általános, más országokban is jelentkező módszertani problémára, ellentmondásra hívja fel a figyelmet, amelyeket az előretekintési programok tervezése, végrehajtása és az ajánlások megvalósítása közben célszerű figyelembe venni, majd a tervgazdasági múlt örökségeként jelentkező, sajátos magyar nehézségeket emeli ki.

OUTLINE

1. INTRODUCTION

Having completed the first phase of transition, Hungary arrived again at a cross-roads. While the one-party system has been replaced with a multi-party parliamentary democracy and the planned economy with a market economy based on private ownership, the world has significantly changed during this historically short period of time. Hungary's intellectual and material resources have been allocated to accomplish the fundamental social and economic transformation process as quickly as possible, that is, mainly to focus on 'burning' issues, e.g. budgetary pressures, current account and trade imbalances, rocketing foreign debts, inflation, privatisation. A number of new political and economic institutions, required for long-term development, have also been (re-)introduced. Yet, most of the efforts have had to be devoted to solve short-term problems, and thus it has been hardly possible to pay sufficient attention to the emerging global trends, to put Hungary into a changing broad picture.

Thanks to significantly improved economic performance by the second half of the 1990s, a long-term approach became possible. Moreover, given major European and global developments (e.g. enlargement of the EU envisioned by 2004, structural changes in a number of industries) this new approach is not simply possible, but is, actually, inevitable. Hungary has to consider what role to play in the globalising learning economy, i.e. what future it envisions for herself. To be more specific: does the country passively accept the fate of a mere surviving economy, drifting without having its own strategy? Or, by implementing a clear strategy, does Hungary intend to be prosperous country, where in 15-20 years most citizens will enjoy high living standards, good health and a clean environment?

TEP, the Hungarian Technology Foresight Programme, was launched in 1997, as the first one in Central and Eastern Europe, to provide valuable inputs to a national strategy by identifying socio-economic challenges and developing broad visions for the future. Specifically, it was aimed at analysing Hungary's current strengths and weaknesses, developing scenarios (visions) and formulating policy proposals to improve quality of life and the long-term international competitiveness.

This presentation first briefly defines the concept and methods of (technology) foresight, and highlights some reasons why it is a useful policy tool, followed by a brief account of the objectives and methods of TEP. Then, summarising the results, *Sections 3* and *4* provide an overview of the transition process (institutional changes as well as economic develop-

ments) and the current socio-economic challenges, respectively. Changing the time horizon, 3 long-term macro scenarios are discussed in *Section 5*, together with policy recommendations developed by TEP so as to achieve the most desirable – but still feasible – vision. Section 6 summarises the results of the dissemination and implementation phase of TEP. Finally, the concluding section highlights the benefits of foresight to assist decision-makers; some general difficulties concerning its design, methodologies and implementation of its results; as well as specific Hungarian problems, due to the legacy of planning.

2. Foresight as a Tool to Identify Challenges, Visions and Policy Options

2.1. Foresight: Definition, Methods and Ration*ale*

Foresight can be defined as "a systematic means of assessing scientific and technological developments, which could have a strong impact on industrial competitiveness, wealth creation and quality of life" (Georghiou, 1996). It should be also emphasised that it is based on the participation of various communities, bringing together the experience and knowledge of researchers, business people, government officials and ideally the viewpoints of lay people, too. It is aimed at gathering and generating intelligence concerning alternative futures, developing long-term visions, building consensus about a desirable – and feasible – future, and mobilising joint actions, including present-day decisions to achieve the shared vision.

Foresight can improve the policy formulation process in a number of ways, e.g. by

- emphasising the possibility of alternative future*s*, and hence the opportunity of shaping our futures,
- broadening perspectives via bringing together people with different experience,
- encouraging creative thinking ('outside the box').

Foresight programmes may have dissimilar foci, ranging from addressing broad socio-economic needs to the identification of priorities in a narrowly defined S&T context. They can have rather different geographical scopes, too, i.e. they can be conducted at international (group of countries, collaborating regions transcending national borders), national, regional, local, sectoral or firm level.

Foresight programmes can be product or process-oriented, depending on the policy needs to serve, e.g. informing specific decisions with analytical reports, list of priorities, recommended actions vs. facilitating networking, communication and co-operation among key players. Foresight programmes might be initiated/ financed by different organisations, players: international organisations, national, regional or local governments, professional associations, chambers, a specific group of, or individual, firms, NGOs.

These programmes can be supported by a number of analytical and participatory methods ranging from desktop research, expert discussions and brainstorming, SWOT- and trend analyses, scenario-building, Delphi-survey, to various forms of stakeholder involvement (workshops, consensus conferences). Some of them are exploratory in their nature (starting with the present situation and then identifying potential future states), while others are normative ones (describing desirable futures and asking what paths could lead there). In certain contexts, for certain purposes quantitative methods are more relevant, whereas in other cases qualitative ones can or should be used.[1]

Needless to say that the broad aims, scope, orientation, geographical level, participants and methods are closely interrelated, i.e. albeit a large number of combinations is feasible, they cannot be 'mixed' freely. In other words, relevant policy needs should be addressed by applying appropriate tools, and involving relevant players. Given the wide choice of aims and techniques, it is of utmost importance to develop a clear programme concept at the outset, and then design a consistent, thorough project plan.

The increasing number of foresight programmes suggests that foresight can be a useful policy tool in rather different national innovation systems. As a growing body of literature analyses this surge, the major factors explaining the diffusion of foresight can be summarised in a telegraphic style:

- Globalisation, sweeping technological and organisational changes, as well as the ever-increasing importance of learning capabilities and application of knowledge have significantly altered the 'rules of the game'. Thus, governments have to take on new responsibilities (as well as dropping some previous ones), while firms must find new strategies to remain, or become, competitive in this new environment.

[1] For a more detailed treatment of methods see e.g. Cuhls *et al*,. 2002 and FOREN, 2001, while the other papers and books listed in the 'Selected literature on foresight methods and experiences' describe or compare various foresight programmes.

- Decision-makers face *complex* challenges: socio-economic and technological factors interact in defining issues of strategic importance, e.g.
  - competitiveness (at national level for attracting talents and capital, at firm level maintaining and increasing market shares nationally and internationally);
  - quality of life (health, education, demographic changes, especially the growing share and special needs of elderly people, living and working environment, social conflicts, crime prevention, etc.);
  - environmental issues;
  - education and life-long learning (new demands on education systems; new, mainly IT-based tools and methods for teaching and learning; the growing need for interaction and co-operation with businesses);
  - regional disparities.
- The dissemination of flat organisations leads to new decision-making methods and more responsibilities for groups and individuals, and thus new skills and behaviour are required (e.g. problem-solving, communication and co-operation skills in multi-disciplinary, multi-cultural teams, as well as creativity). This, in turn, creates new demands on the education and training system (see above).
- Various types of clusters and networks (business – academia, business – business, both at national, international levels) and other forms of co-operation have become a key factor in creating, diffusing and exploiting knowledge and new technologies, and therefore in satisfying social needs and achieving economic success.
- Quite often technological changes occur and diffuse before policy-makers can fully understand the mechanisms at work and socio-economic repercussions so as to formulate appropriate policies (e.g. the recent developments in biotechnology, especially cloning and stem cell research).
- Given growing political and economic pressures, governments try hard to balance their budgets, while cutting taxes, and hence they need to reduce public spending relative to GDP. In the meantime accountability – why to spend taxpayers' money, on what – has become even more important in democratic societies. Public R&D expenditures are also subject to these demands.
- Policy-makers also have to deal with intensifying social concerns about new technologies (mainly ethical and safety concerns in the case of

biotech, nuclear, and fears of unemployment and social exclusion caused by the rapid diffusion of information and communication technologies).

In sum, a participative, transparent, forward-looking method is needed when decision-makers are trying to find solutions for the above challenges. Technology foresight offers an essential tool for this endeavour. It helps in making choices in an ever more complex situation by discussing alternative options, bringing together different communities with their complementary knowledge and experience. In doing so, and discussing the various visions with a wide range of stakeholders, it also leads to a more transparent decision-making process, and hence provides a way to obtain public support. Foresight processes can reduce uncertainty, too, because participants can align their endeavours once they arrive at shared visions. Many governments have already realised the importance of foresight activities, and thus this relatively new, and innovative, technology policy tool is spreading across continents.

The above general considerations apply in transition countries, too. Quite a few pressures – especially the need to change attitudes and norms, develop new skills, facilitate co-operation, balance budgets – are even stronger than in the case of advanced countries. Moreover, these countries also have to cope with the challenges of transition: loss of former markets, and hence the need to find new ones; fragile international competitiveness; relatively poor quality of life; brain drain. Foresight can be a useful tool in these interrelated endeavours.

Foresight, however, is not a panacea; it cannot solve all the problems listed above, and cannot solve any of them just on its own. Obviously, other methods and tools are also required, as well as an assiduous implementation of the strategies devised either at national, regional, sector or firm level.

2.2. Objectives of TEP, the Hungarian Technology Foresight Programme

As the so-called transformational recession (Kornai, 1994*a*) turned into economic growth by 1996-97, some policy-makers thought it was time to think about medium and long-term issues in Hungary. TEP, therefore, was launched in 1997 to *identify new market and technology opportunities* and devise adequate responses in order to *achieve long-term competitiveness,* and *improve quality of life*. In other words, the overall objective was to contribute to a strategy for a *socially, economically and environmentally sustainable development*.

More specifically, the goals were defined as follows:

1. contribute to a national innovation strategy based on a comprehensive analysis of
   - technological development,
   - world market opportunities (new markets and market niches),
   - strengths and weaknesses of the Hungarian economy and R&D system,
2. help Hungarian firms improve their competitiveness via the results of the above analysis,
3. strengthen the formal and informal relationships among researchers, business people and civil servants,
4. spread co-operative and strategic thinking,
5. support integration into the European Union,
6. formulate recommendations for public policies.

It was also decided that – following the methods of the first British technology foresight programme – panels should be set up to develop scenarios as well as policy recommendations, and a two-round, large scale Delphi-survey should also be conducted.

Ministries, interested government agencies, professional associations and chambers were asked in July-August 1997 to nominate Steering Group members, emphasising that they were not supposed to represent any organisation, but participate actively in a strategic discussion process, relying on their knowledge and experience. Relying on these nominations, a Steering Group of 20 leading industrialists, academics and government officials – deliberately comprising a majority of industrialists and academics with close contacts with businesses – was appointed by the OMFB Council in October 1997 to oversee the Programme.

A few months later an Inter-ministerial Committee was also established, comprised of representatives of ministries and government offices, as a vehicle for a two-way communication: to discuss the preliminary results of TEP and provide information on their on-going strategic projects for the Steering Group and panels.

2.3. Methods and Outcomes of TEP

TEP was conducted in three stages, namely pre-foresight (July 1997 – March 1998), main foresight (April 1998 – May 2000), dissemination and implementation (June 2000 onwards) stages.

2.3.1. Pre-foresight

Awareness seminars were held across the country in the pre-foresight stage to promote TEP among experts and professionals. Seminar participants and organisers (that is, chambers of commerce and scientific associations) were also invited to nominate panel members, together with ministries and government agencies. In the meantime, the Steering Group decided to set up the following panels:

- Human resources (education, employment)
- Health
- Information technologies, telecommunications, media
- Natural and built environment
- Manufacturing and business processes (new materials, production processes and management techniques, supplier networks)
- Agri- and food businesses
- Transport.

Panel chairs and secretaries were appointed by the Steering Group, while panel members were invited by chairs and secretaries, in either case relying on their own suggestions and the nominations collected through the above consultation process.

2.3.2. Main foresight

Panel reports

The seven panels provided a snapshot of their respective fields, analysing human resources, techno-economic performance, as well as institutions and regulations, identified major technological and socio-economic trends, and developed alternative visions for the future.[2] They mainly relied on the expertise of their members, but commissioned reports from other experts as well. These tentative results were discussed within the wider expert community at workshops held across the country, organised jointly with the regional chambers of commerce and professional societies. All the background reports, the alternative visions and the Delphi-results were

[2] The terms of 'visions', 'futures' or 'scenarios' are mostly used as interchangeable ones in the foresight literature, although 'scenarios' might well also have a narrower meaning: a 'time-line' of actions and events leading to a specific end state. If this distinction is applied, it is more appropriate to speak of visions or futures in the case of TEP. Some of these visions, however, especially the ones developed by the *Transport* panel, are rather close to scenarios, narrowly defined.

posted on the Internet as soon as they became available. (http://www.om.hu/j2tepuj.html)

Panel reports drew upon background reports (some 15-25 background reports were commissioned by each panel), panel discussions, Delphi-results and conclusions from the regional workshops. These were structured as follows: a critical appraisal of the present (a sort of SWOT analysis: strengths, weaknesses, opportunities and threats), alternative futures (visions)[3] and recommendations for realising the most desirable – but of course still feasible – future. Draft panel reports were discussed at a national conference in June 2000, and finalised feedback from the conference. These revised reports were published electronically a few months later, and then in hard copies in May 2001.

At the request of some panels, a separate expert group was commissioned to analyse the field of energy, following the structure of the panel reports, but without a Delphi-survey in this field.

Delphi-survey

Each panel formulated statements for a Delphi-survey identifying the major trends in Hungary and studying foreign questionnaires (the fifth Japanese, the second German, the British and Austrian ones). The Delphi-statements were revised several times to ensure that experts who were not panel-members would understand them in the same way. Then, a small pilot survey – with 5-7 non panel-member experts for each questionnaire – was conducted, leading to the final round of revision.

Co-nomination (Nedeva *et al.,* 1996) was used to identify potential respondents, started with panel members in the first round. The entire Delphi-survey, including the co-nomination process and the small pilot study to test the questionnaires, was administered by a pollster company, selected at a public tender. The tender had not specified either the size of the pool of experts or the method how to collect questionnaires, only a target was set: around 200 questionnaires had to be returned in the first round so as to have a sufficient number of answers for statistical analysis.

Each questionnaire consisted of 60-80 statements and the following questions:

- Respondents' degree of expertise (options ranging from 'unfamiliar', 'casually acquainted', 'knowledgeable' to 'expert')

[3] See some examples of the visions developed by TEP panels in the *Appendix*.

- Respondents' assessment of economic and social impact, and impact on natural environment (options ranging from 'strongly harmful', 'slightly harmful', 'neutral', 'slightly positive' to 'significantly positive')
- Period within which the event/development will have first occurred (including "never")
- Hungary's current position vs. advanced European countries in the following four respects: S&T capabilities, exploitation of R&D results, quality of production or service and efficacy of regulation (options ranging from 'unacceptable', 'lower level, but acceptable', 'fairly similar', to 'higher level'
- Constraints: social/ethical, technical, commercial, economic, lack of funding, regulatory standards, education/skill base (options: yes or no)
- Promotion of development, application: domestic R&D, purchase of licence, know-how or ready-made products (ranking the relevance of these three policy tools).

The first round of the Delphi-survey was completed in May 1999. Some 1400 questionnaires were returned (i.e. on average 200 for each panel, as it was targeted).[4] The second round was completed by the end of 1999. Although data were used by panels for their final reports, this rich set of data can – and, indeed, should – be exploited by more detailed, more systematic analyses as well, for instance by firms and research institutes for their own purposes as well as by policy analysts, e.g. comparing the Hungarian results with foreign ones.[5]

Steering Group report: macro visions and policy recommendations

While only meso-(or panel-)level scenarios were envisaged initially, both the Steering Group and a number of panels noted in the course of TEP the need to develop visions for alternative futures at a macro-level, too. These are discussed in detail in Section 5, but first the results of the transition process and the current socio-economic challenges – as identified mainly by TEP, but supplemented with other analyses – are summarised in *Sections 3* and *4*.

[4] The characteristics of the sample – composition by gender, age, affiliation, type of activity and respondents' degree of expertise – are reported in Havas, 2000.

[5] Preliminary analysis has shown that around 20-40 per cent of the statements is comparable.

3. TRANSITION FROM PLANNING TO MARKET ECONOMY[6]

3.1. Legacy of Planning

One of the underlying postulates of evolutionary economics is that 'History does matter'. It is, therefore, worth recalling some of the main characteristics of the planned economy period, especially those that had influenced the institutional system.[7]

The Soviet model of both social and economic institutions, including state ownership, central planning, mono-party system, trade unions controlled by the Communist Party, etc., had to be introduced in Hungary, as in all other Central and Eastern European countries dominated by the Soviet Union, in the late 1940s. This abrupt change had far-reaching impacts on the every day life of people, the domestic and foreign politics of these countries, their economies, and hence their science and technology (S&T) systems as well.[8]

Central planning and the rationale of the so-called party-state did not allow sustaining the complex set of various independent economic, social and political institutions, co-operating and co-evolving in a number of ways through horizontal links. Excessive centralisation of all social, cultural, political and economic activities required vertically organised, insulated sub-systems. Relationships among these sub-systems were only established at the very top level, e.g. R&D, production and trade functions were separated not only at firm level, but also at the level of the ministries, and hence co-ordination was only possible at the highest political level. Firms became mere production units, with no responsibility, and no means to conduct R&D, buy raw materials, trade their products or control their finance. As for international relations, the former intense trade and ownership links as well as R&D co-operation with Western firms were cut off, and Hungarian com-

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[6] This section draws both on some previous papers by the author (Havas, 1999, 2001, 2002a) and TEP results.

[7] Space limits prevent any analysis of the norms and behaviour of the major players in the current period, and thus the 'imprint' of the planning system – however important it is – on these factors, cannot be explored here, either.

[8] Several changes have occurred since the 1960s in Hungary. Most importantly the centrally set, mandatory plan targets were abolished as early as 1968, and hence certain norms and attitudes prevailing in market economies disseminated widely among enterprise managers. The standard of living was one of the highest among CMEA (Council for Mutual Economic Assistance, the trade organisation of the former Soviet Bloc) countries.

panies became dependent on other CMEA countries both in terms of raw materials and export markets. Exports and imports, as well as domestic trade, were also separated from manufacturing firms, and were exclusively conducted by separate state-owned companies.

A rigid system of division of labour was also imposed on S&T organisations: basic research was assigned exclusively to research institutes of the Hungarian Academy of Sciences (HAS),[9] while applied research and development had to be performed by the so-called branch R&D institutes, supervised by branch ministries. Teaching, on the other hand, became the only task of universities, i.e. departments were not supposed to conduct research projects, and thus were not given resources for such activities. Horizontal links among academia and industry were also cut off.[10] R&D co-operation of Hungarian researchers with Western universities and research institutes was also controlled along political lines, and hence became much more difficult to maintain, thus weaker and weaker (as in the case of firms' co-operation with their Western partners).

The whole system, and thus the S&T subsystem has become far less rigid and more decentralised since the 1960s, e.g. HAS institutes were engaged in applied research and teaching, too, while university departments also started research projects. Yet, hardly any co-operation has evolved among these 'insulated' sub-sectors of R&D.

In spite of a relatively strong and successful research system, reflected by publication and citation indices, exploitation of scientific results for economic and social purposes was rarely a success in Hungary, just as in all other planned economies in Central and Eastern Europe. (Hanson and Pavitt, 1987) Academia-industry links were weak and ad hoc, as was communication and co-operation among other players.[11] Moreover, a number of crucial institutions required for a strong national innovation system either did not exist, or existed only in a distorted form (e.g. the so-called

[9] HAS was established in 1825 by a rich, enlightened aristocrat, István Széchenyi.

[10] Until the 1940s large companies had intense co-operation with universities. In addition to the usual way, that is, commissioning university departments to conduct certain research projects, some of these firms were actually spin-off firms from universities (e.g. MOM, an optical company), while others even set up new university departments (e.g. Tungsram established the nuclear physics department at the Technical University in Budapest).

[11] On the importance of communication, co-operation and networking among innovative firms and other organisations involved in knowledge production, see e.g. Freeman 1994, 1995, Freeman and Soete, 1997, Lundvall and Borrás, 1998, special issue of Research Policy on innovation systems (Volume 31, No. 2).

bridging institutions and financial, trade and legal services specialising in meeting the needs of innovative enterprises). In brief, the very process of innovation was regarded as unimportant, and hence did not receive the adequate attention, resources and institutional backing. (Balázs *et al*., 1990, Havas, 1999, OECD, 1993)

3.2. Economic Developments since 1990[12]

3.2.1. Inherited economic problems

The Hungarian foreign trade structure was heavily biased towards the CMEA (both in terms of imports and exports), and thus when CMEA was abolished in 1991, most Hungarian firms lost major markets practically overnight. Moreover, excessive debts had been accumulated by the late 1980s because of an interplay of political and economic reasons: the economic system was unviable, yet, given the 1956 revolution the political leadership wanted to prevent further social unrest, and thus – together with other 'social engineering' techniques – tried to maintain an artificially high standard of living, financed by foreign loans. (These loans, in general, were used to conceal the fundamental problems of the planning system.) By the late 1980s, however, no sophisticated disguising technique was sufficient enough to hide the fact that most companies were making loss. The excessive centralisation zeal distorted the size distribution of firms (towards large companies), too, contributing to economic problems (lack of competition and all its corollaries). All these constituted significant difficulties when the transition to market economy was attempted in 1989-1990.

Thus, given the heritage of planned economy, not only a 'usual', 'simple' macroeconomic stabilisation was required in Hungary in the beginning of the 1990s, but a much more challenging, more complex modernisation programme had to be implemented. In brief, systemic changes (or fundamental structural, institutional changes) were required in order to 'remain on the map' of viable countries. This difficult enough task was further exacerbated by an additional factor, too. Most Hungarian citizens (like in other transition countries) associated the economic and social psychological hardship of the 1990s with the new socio-economic (political) system, although the harsh austerity measures were necessitated by the legacy of the former system. Therefore policy-makers and politicians were reluctant

[12] Space limits only allow a brief overview here. For further details – and contrasting views on the results of the transition process in the 1990s – see, e.g. analyses by Antal, Csaba, Farkas, Halpern and Wyplosz, KOPINT-DATORG, Kornai, Köves and Oblath listed in the References.

to devise and implement a 'textbook-case' modernisation (structural adjustment) programme. They were inclined to 'soften' macroeconomic policies as soon it seems to be possible, usually earlier than it was really feasible and reasonable from a strict economic point of view.[13]

3.2.2. Transition: institutional changes

The first phase of the transition process in Hungary is over by now. The most important political and economic institutions have been re-established, e.g. a parliamentary democracy based on a multi-party system, private ownership of assets, free factor and commodity markets and the stock exchange.[14] Some crucial economic institutions – e.g. a two-tier banking system, a 'Western-type' taxation system (VAT, personal income tax) – were introduced as early as 1987, that is, even before the political changes. Most firms and banks have been privatised by the mid-1990s, mainly by foreign investors, that is, by genuine owners (as opposed to 'artificial' ones created by various voucher schemes in other transition countries).

In 1990, the proportion of state ownership was over 90 per cent in the Hungarian economy. By 2000 this had reached almost the opposite end of the scale with private ownership representing almost 80 per cent. A similar change took place in the structure of GDP: the contribution to GDP of the private sector was some 25 per cent in 1990, increasing to 90 per cent by 2000.

The institutional structure of economic policy-making and its implementation have been significantly re-organised. The independence of the Hungarian National Bank is guaranteed in law. The state budget has been reorganised into independent sub-systems, and its deficit is now funded by the capital market. The financial sector has been restructured. Competition has emerged in the commercial banking and insurance sectors, and a large number of consultancy and brokerage firms have been established. The Competition Office is now in operation and extensive reforms have been introduced in the social security system.

A number of important tasks still remain, however, including the achievement of legal harmonisation with the EU and the continuation of state budget reforms.

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[13] Qualitatively it might be similar to the behaviour of politicians and policy-makers in long-established market economies. Quantitatively, however, the differences are likely to be significant, i.e. the extent to which relatively inexperienced policy-makers in a more demanding situation tend to 'shy away' from austerity policies, as well as the socio-economic repercussions of these special 'stop-go' policy cycles.

[14] The stock exchange was re-opened in 1989, i.e. before the political transition.

3.2.3. Transition: macroeconomic performance

Hungary has inherited an unviable economic system: most companies accustomed to enjoy quasi-monopoly in the domestic market and a huge, 'hungry', therefore not too demanding export market; regular bailouts, whenever it had been necessary; distorted size distribution of firms (lack of SMEs, inflexible, large firms, yet, lacking economies of scale as they had been created artificially, by merging medium-sized firms located in different parts of the country); skewed foreign trade structure and excessive debts by the late 1980s. With the collapse of CMEA practically all large firms lost their markets overnight, and in turn their domestic suppliers, too. That was a 'recipe' for the most severe economic crisis in the history of Hungary; its consequences were at least as severe as the impacts of the Great Depression in 1929-33. In the first 3 years of transition more than 1.5 million jobs were lost, and the GDP dropped by almost 20%.

After that sharp decline in the early 1990s the Hungarian economy is now 'bouncing back': decreasing inflation and unemployment rates together with accelerating GDP growth characterised the last 4-5 years *(Tables 1-2)*. GDP has reached the 'pre-transition' level, that is, 1989, by 1999. Economic growth is almost twice as much fast than the EU average (2.5% and 3.4% for the EU-15 in 1999 and 2000, respectively). Foreign direct investment per capita is the highest – since 2000 'neck-to-neck' with the Czech Republic – compared to other Central and Eastern European countries (over 2000 USD).

Table 1

GDP in Central Europe, 1990-2000 (1989 = 100)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Croatia	92.9	73.3	64.7	59.5	63.0	67.3	71.3	76.2	78.1	77.8	80.7
Czech Rep.	98.8	87.3	86.9	86.9	88.9	94.1	98.2	97.4	96.3	95.9	98.7
Hungary	96.5	85.0	82.4	81.9	84.4	85.6	86.8	90.7	95.1	99,1	104.2
Poland	88.4	82.2	84.4	87.6	92.1	98.6	104.5	111.7	117.1	121.8	126.7
Slovak Rep.	97.5	83.3	77.9	75.1	78.7	84.0	89.3	94.8	98.7	100.6	102.8
Slovenia	91.9	83.7	79.1	81.4	85.7	89.3	92.4	96.6	100.3	105.5	110.4

Source: Economic Commission for Europe: Economic Survey of Europe, 2001 No.2

Table 2

Main economic indicators, 1990-2000 (previous year = 100)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
GDP	96.5	88.1	96.9	99.4	102.9	101.5	101.3	104.6	104.9	104.2	105.2[b]
Exports	95.9	95.1	102.1	89.9	113.7	113.4	107.4	129.9	122.5	115.9	121.7
Imports	94.8	105.5	100.2	120.2	108.8	99.3	105.7	126.4	124.9	114.3	120.8
Consumer price index	128.9	135.0	123.0	122.5	118.8	128.2	123.6	118.3	114.3	110.0	109.8
Trade balance ($ bn)	0.9	-1.2	-0.4	-3.6	-3.9	-2.6	-2.4	-2.1	-2.7	-3.0	-4.0
Current account balance (Euro bn)	0.1	0.2	0.2	-3.0	-3.3	-1.9	-1.3	-0.8	-2.0	-1.9	-1.4
Foreign direct investment[a] (Euro bn)	..	1.2	1.1	2.0	1.0	3.5	1.4	1.6	1.3	1.5	1.5
International reserves (year end, Euro bn)	..	3.0	3.6	6.0	5.5	9.4	7.8	7.6	8.0	10.9	12.1
Registered unemployed (year end, thousands)	80	406	660	632	520	496	478	464	404	405	372
Budget balance/GDP (%) (without privatisation proceeds)	0.3	-2.9	-7.0	-5.6	-8.4	-6.8	-3.1	-4.6	-6.3 (-4.6 [c])	-3.7	-3.4
Net foreign debt (including loans provided by parent firms for subsidiaries, Euro bn)	11.8	10.9	10.8	13.4	15.4	12.7	11.7	10.7	11.0	11.2	12.2

Source: CSO, Ministry of Finance, National Bank of Hungary

[a] *Equity capital; * Without extraordinary, consolidation-type expenditures;* [b] *Preliminary data;* [c] *Without extraordinary, consolidation-type expenditures*

Investments

The volume of investments generally corresponded to the decline in GDP generation after 1990. The investment ratio reached its lowest point in 1993 at the level of 18.9 per cent and increased thereafter on a continuous basis to a level of around 24 per cent by 2000. (In 1989 this indicator was 21.6 per cent). The volume of investments in 1992 was approximately 80 per cent of that in 1989 and reached again the 1989 level in 1997.

Employment

Between 1990 and 1996 the total workforce decreased by 1.5 million, that is, almost by 30 per cent, close to 4 million. Two-thirds of the decrease was registered in the first three years of that period. Unemployment was practically unknown in Hungary, just as in other planned economies, and in three years it jumped to 700 thousands. The highest rate of unemployment was 14.1 per cent.

The number employed in the business sector decreased substantially whilst hardly any decrease was apparent within the public administration. Agriculture and industry suffered the heaviest losses. Declining production and changes in ownership structures in the agriculture led to a loss of approximately two- thirds of the previously registered workforce. (The actual number of persons making a living in agriculture is probably higher than the statistically registered level as many non-registered people work in this area as family members.)

There has been an annual growth of 1 per cent in the average number of employed persons since 1996. By the end of 2000 the number of registered unemployed has been halved, compared to the peak in 1993. However, the number of economically inactive people (in the age group of 15-74) increased by more than 800 thousand between 1989 and the end of 1997. At its peak it was 3.8 million, and decreased to 3.5 million by the end of 2000.

The radical increase of unemployment in the first half of the 1990s took place with no visible social conflicts in Hungary. This may be explained by the unemployment benefit system, which was very generous at its inception. However the avoidance of conflicts was also a result of a ‘closing our eyes’ attitude to the increasing black economy.

Actually, employment data might be a good indicator for the speed and ‘depth’ of transition. Given the well-known deficiencies of planned economies, when employment first is contracting fast, and then picking up – albeit more slowly – one can assume a fast and fundamental restructur-

ing. On the contrary, when the previous level of employment is reducing rather slowly, that indicates the safeguarding of a large number of inefficient companies – and hence jobs.

Short-term Outlook

Forecasts for 2002 suggest that the current trend of economic growth would continue, albeit at a lower pace, and unemployment rate would further decrease. Inflation would also continue to slow down. The budget deficit, however, is going to deteriorate, and the trade and current account balances are forecast to worsen, too *(Table 3)*.

Table 3

Preliminary macroeconomic data and forecasts, 2001-2002 (previous year = 100)

	2001	2002
GDP	103.8	103.2
Exports (calculated at current € price)	111.0	107.0
Imports (calculated at current € price)	108.0	111.0
Consumer price index	109.2	105.7
Trade balance (€ bn)	-3.5	-5.0
Current account balance (€ bn)	-1.2	-2.5
Registered unemployed (average, %)	5.7	5.9
General govt. balance/GDP* (%)	4.1	5.0

Source: GKI Economic Research Co., monthly macroeconomic forecast, 29 April 2002, http://www.gki.hu

Note: * According to the EU standards. The Ministry of Finance reported 3.3% for 2001, excluding certain expenditures spent through the Hungarian Privatisation and State Holding Company and the Hungarian Development Bank Ltd.

3.2.4. Transition: microeconomic adjustment

A strict macroeconomic management regime (since 1995-96) has undeniably contributed to the successful macroeconomic performance. Behind these figures, however, another crucial factor can also be identified, namely the costly and painful microeconomic adjustment. Most companies have been privatised, and fundamentally restructured in terms of their products, markets, production processes, organisational forms and managerial techniques applied. In short, gales of creative destruction have been strong and effective.

Privatisation has been largely completed by the late 1990s, now there are only a handful of state-owned companies and banks, which could be sold.

The liquidation of over-sized and non-productive industrial capacities was a necessary exercise. Competition from imports also weakened the local market position of Hungarian companies together with the decrease in the demand from internal and external markets. At its lowest point in 1992, the volume of industrial sales was some 30 per cent below the 1989 level.

Industrial productivity has shown considerable growth since 1993, around 10% a year. Real wages did not follow this trend; international competitiveness of the economy, therefore, has significantly improved since 1995.

Manufacturing industry stabilised as early as 1992-93 following its previous decline, and dynamic growth was experienced from 1994 onwards. Engineering industry proved to be the most successful in managing the crisis although in 1992 it suffered the second largest drop in output of all industries after the metallurgy industry. Engineering industry, the only one in the industry sector, reached the production level of 1989 as early as 1996 by implementing fundamental structural reforms and gaining new export markets. The industrial sector as a whole only achieved this result in 1998.

FDI and privatisation have brought about new products, processes and management techniques with access to new markets on the one hand, and a strong pressure to introduce these technological and organisational innovations – otherwise there is no chance to survive the loss of former (CMEA) markets and harsh competition in the new ones, either in the export markets or in the open, liberalised domestic one.

A major positive trend has been the strong export-orientation of the industrial sector, largely due to the fact that quite a few Hungarian firms – especially those in automotive and electronics components, as well as in telecom equipment manufacturing sectors – have been re-integrated into the international production networks, either as subsidiaries or independent suppliers of multinational corporations (MNCs). Trade data show a rather radical restructuring both in terms of the main export markets – a swift move towards the overriding share of the EU *(Table 4)* – and in the composition of exported goods, that is, a move towards higher value-added products. Meat and semi-finished products have been 'dethroned' by telecom equipment, electric, energy generation and office machinery by 2001 *(Table 5)*. This remarkable performance in such competitive markets could have not been achieved without strong innovation activities.

Table 4

Share of the EU/EC countries in Hungary's foreign trade (per cent)

	1989	1994	1999	2000	2001
Export	24.8	51.0	76.5	75.1	74.2
Import	29.0	45.0	64.0	58.4	57.8

Source: Central Statistical Office (1989-1999), Ministry of Economic Affairs (2000-01)

Table 5

Share of the top 10 commodity groups in the Hungarian exports (1990, 2001)

1990		**2001**	
Commodity groups	**share (%)**	**Commodity groups**	**share (%)**
Meat products	10.1	Telecommunications equipment	12.6
Chemical semi-finished products	8.6	Electric machinery and components	11.9
Steel semi-finished products	7.1	Energy generation machinery	10.7
Clothing	6.8	Vehicles	8.9
Vehicles	4.8	Office machinery	8.3
Metallurgical raw materials	4.2	Clothing	4.4
Canned fruits and vegetables	3.3	Other processed products	2.9
Chemical raw materials	3.2	General machinery	2.9
Metal semi-finished products	2.3	Metal products	2.2
Pharmaceuticals	1.7	Meat and meat products	2.2
Total	*52.1*	*Total*	*67.1*

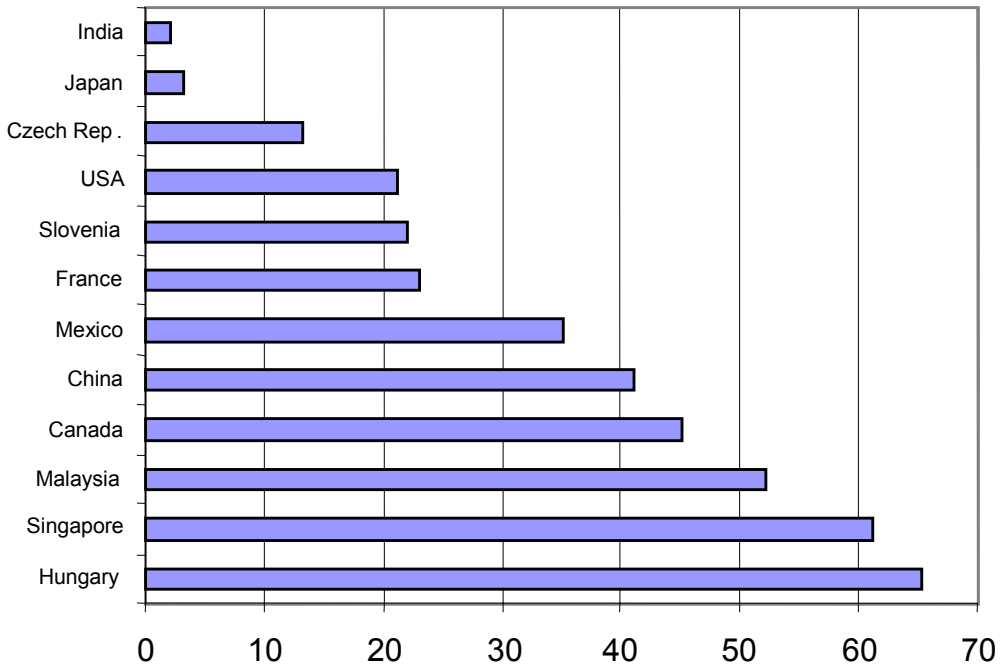
Sources: Foreign Trade Statistical Yearbook, 1990 and Press release on Foreign Trade, January-December 2001, preliminary data, Ministry of Economic Affairs and Ministry of Foreign Affairs, 22 February 2002

The share of MNCs in industrial export exceeded 65% by 1999. Nine of the top 10 exporters are foreign-owned firms: IBM, Audi, Philips, GM

Opel, GE – Tungsram, Magyar Suzuki, Alcoa-Köfém (aluminium products), Tisza Chemical Works and Neutronics (electronics components).[15]

Figure 1

Share of multinational companies in the industrial export of some countries



Source World Investment Report, 1999, UNCTAD

The above macro- and microeconomic developments – a liberalised, stabilised, growing market economy with a strong presence of multinationals and other foreign investors – and trends are favourable on the whole from the point of view of innovation and further growth, although inflation is still too high. It is also important that the physical infrastructure is developing quickly in some fields, especially in telecommunications (at least 300% growth of telephone lines in some years, etc.). Further, the number of university students has grown from 102 thousand to 280 thousand in eight years.

[15] Three of them are former Hungarian firms acquired by foreign investors, while six of them are green-field plants.

4. SOCIO-ECONOMIC CHALLENGES

Remarkable results were achieved in Hungary in the past decade, particularly in terms of improved international competitiveness. However, if we take a long-term approach, several issues cause concern and call for action. TEP, the Hungarian Technology Foresight Programme has identified a number of these challenges. (TEP, 2001)

4.1. Human resources

4.1.1. Education

In spite of the fact that the number of students entering secondary schools and of those attending higher education institutions increased substantially in the 1990s, Hungary is still lagging behind the developed countries in this regard. More alarmingly, most Hungarian schools follow the Prussian paradigm of teaching, and can be characterised by a lack of openness and flexibility. They prepare their students inadequately for the future, as they do not develop the skills required for life-long learning, co-operation, communication and problem solving in (multicultural, multi-disciplinary) teams. They primarily transmit information that is subsequently supposed to be recited.

The former structures, methods and principles have become obsolete and the performance of schools operating in accordance with the old values is in continuous decline, even in comparison with the performance indicators of the previous decade.

The ratio of GDP spent on education was already lower than the OECD average in 1995. The gap widened as a result of the overall cuts in public spending in the subsequent years and the increase in spending on education did not remain in line with the increase in the country's GDP even after the successful macro-economic stabilisation. Real expenditures per capita decreased considerably, primarily in the areas registering an increase in the number of students (secondary and higher education).

Whereas companies have realised the importance of skills and knowledge to maintain their competitiveness, and pay their employees accordingly, most teachers and researchers are underpaid to such an extent that a decreasing proportion of talented young people are choosing teaching or research as a career.

These trends may widen the development gap. They are also diminishing Hungary's ability to exploit the potential benefits of the next decade,

particularly those provided by biology, biotechnology, and information and telecommunication technologies.

4.1.2. Health

The population's health is a cause for concern and it is much worse than expected given the level of economic performance. The most serious public health problems are posed by non-infectious chronic illnesses, most of which could be prevented or postponed by well-targeted actions. Hungary's population has been decreasing on a continuous basis since the 1980s due to a declining birth rate and a high mortality rate. The mortality rate of the middle-aged male population is reminiscent of that of the 1930s. It is therefore not surprising that the average life expectancy at birth for Hungarian males (66.3 years) is nine to ten years below the same indicator in Austria, Japan, Switzerland or Sweden, and five years lower than in the Czech Republic. The mortality rate of women in the age group of 40-54 is also worse than it was 40 years ago and the average life expectancy at birth for Hungarian females (75.1 years) is six to seven years lower than the same indicator in Belgium, Finland, France, Greece, Italy, Austria, Norway, Spain, Switzerland and Sweden. The population decrease in Hungary could be curtailed should the mortality rate be lowered to the EU average.

These are dangerous trends, even from a mere economic perspective, as the quality of human resources (skills, learning capabilities and health) significantly influences the decisions of investors.

4.2. Environmental challenges

Half of the population lives in areas with high levels of air pollution. Inadequate sewerage systems and water drainage problems (high ground water levels in large areas) are having a negative effect on the water quality. Biodiversity has also deteriorated and in most residential areas the problem of safe community waste disposal has not yet been resolved. Negative developments in environmental pollution have led to widespread respiratory problems and malignant tumours and the propensity to allergies in the country is increasing. The low level of environmental awareness is also adding to the problem.

4.3. Fragmented innovation system, lack of coherent policies

In the early years of transition the underdeveloped, fragile Hungarian innovation system was further weakened: former links were cut off as firms were privatised, R&D institutes reorganised, and R&D expenditures – both

public and private – drastically reduced. A number of R&D units were dissolved when the large domestic companies were restructured and/or privatised, and hence some accumulated knowledge and skills were lost. Since the mid-1990s, favourable developments have occurred, however. Some bridging institutions have been set up and international R&D co-operation has intensified. Foreign firms have brought new technologies in, and diffused them among their suppliers. The number of business R&D units has increased – some of them have been set up by foreign firms –, and firms have started again joint projects with universities and research institutes.

Yet, the links between the different elements of the system are still weaker than they should be; communication and co-operation are at a lower level than desired. Attempts to devise and implement a coherent set of policy tools to strengthen the innovation system have also failed.[16]

Until 1996-97, the most frequently mentioned argument was the alarming deficit of the government budget. However, money is always a scarce resource, and when a country is in a particularly difficult situation then there are even more pressing reasons to devise and implement a sound strategy. From a broader perspective one might identify further, even more compelling reasons. Sobering lessons of the former socio-economic system (poor economic performance in spite of the so-called central development programmes), and partly ideological, partly socio-psychological stances were at odds with the apparently increased role of government. Moreover, there are vested interests against concerted efforts, as government agencies usually prefer not to share their resources with other ones even if this may lead to more efficient public spending.

Further, in the first ten years of transition there were strong illusions and misconceptions concerning R&D and innovation activities and policies. One of these was that scientific knowledge would automatically become technological capability; hence no specifically designed schemes would be needed to facilitate this process. Also, in the first half of the 1990s, it was widely believed that economic development and S&T efforts can be separated, and thus R&D expenditures can be cut without severe socio-economic consequences. The irony is that this view was not without foundations in the specific Hungarian circumstances: given the poor economic performance during the planned economy period, return on R&D expenditures was a largely neglected issue, on the one hand, and new technolo-

[16] For data and more detailed analyses of these issues see e.g. Balázs, 1994, Havas, 1999, 2001, 2002*a*, Inzelt, 1996, 1999, 2000 and TEP, 2001.

gies brought in by foreign investors 'in bulk' in the early 1990s facilitated a quick industrial re-structuring and market re-orientation without much local R&D inputs, indeed, on the other. Yet, there is a major policy problem with this view. Although economic development can be maintained, or even accelerated, without indigenous R&D and innovation efforts in the short run thanks to foreign direct investment, a country opting for this 'development' path becomes not only overly dependent on foreign technologies, but would most likely to lose its attractiveness, too: at best becoming the 'dumping site' of outdated technologies, or even abandoned by foreign manufacturing firms altogether. From a different angle, this way of thinking clearly cuts innovation from R&D, considering the latter one to be a luxury, or a privilege for a narrow elite – ignoring the abundant evidence accumulated by the economics of innovation and all the policy implications. (EC, 1995, Ergas, 1987, Freeman and Soete, 1997, Levin *et al*., 1987, Lundvall and Borrás, 1998, Nelson, 1993, OECD, 1992, 1998a, 1998b, 2000)

4.4. Manufacturing industry: a dual structure

In spite of the remarkably deep and fast economic re-structuring there is still a considerable gap between two groups of manufacturing firms. On the one hand, large, mostly export-driven, efficient and profitable foreign-owned firms, operating high-tech equipment, account for the impressive microeconomic statistics. Most of their local suppliers – either foreign-owned or domestic – are also successful, and have promising prospects. On the other hand, a large number of indigenous, mostly small or medium-sized enterprises can be found, usually lacking capital for development, applying obsolete technologies, and thus facing the threat of bankruptcy, or stagnation with constant, hard struggle for survival – at best a rather risky future with low growth potential.

Only 14 of the 33 largest export companies, accounting for 41.6 per cent of total exports, are engaged in R&D activities in Hungary. Sixty-three of the top 100 exporting companies, accounting for 55.9 per cent of total exports, are majority-owned by foreign shareholders. Only 23 of these 100 companies conduct R&D in Hungary, 14 of which are owned by foreign companies. This means that only 22 per cent of the large, foreign-owned, exporting companies carry out R&D activities in Hungary. The foreign-owned companies possess significant knowledge bases, technological potential and R&D capacities, although not necessarily in Hungary. How-

ever, Hungarian-owned companies are only able to rely on their own resources to maintain or improve their export performance.

4.5. The need for a new model for agribusiness

Agribusiness has already passed its low point but is not yet on a new development trajectory. Efforts and financial resources in this sector are being concentrated on short-term interventions in order to deal with the frequent and severe market disturbances arising from the current agricultural model. Therefore a new model is inevitable. The overwhelming majority of private farms are very small and family-owned although an increase in the average size of land properties is becoming apparent.

The food industry is lagging behind the output and technological level of the 1980s. A large number of former employees became 'forced entrepreneurs' (self-employed) in the food retail and agriculture sectors.

4.6. Digital divide

The infrastructures of information technology and telecommunications have improved considerably during the last decade and both telecommunications service providers and equipment manufacturers started competing on the market. Nevertheless, telecom services are still very expensive even in absolute terms (in an international comparison) and more so relative to the income level of the Hungarian population. Consequently this sector is developing more rapidly in many medium developed countries than in Hungary, resulting in an increasing gap between Hungary and, for example, Austria or Spain.

Moreover, there is a growing digital gap between the various social groups in Hungary. Almost half of personal computer and Internet users belong to the age group under 30 and significant differences occur between small and large settlements, with the latter ones enjoying advantages. However, no comprehensive national strategy has yet been established to meet the challenges presented by the information society and to prepare for the changes in the paradigms and values caused by the recent technological and structural changes in the world economy.

4.7. Underdeveloped transport infrastructure

The Hungarian transport system is underdeveloped. The country will have to request derogation in the introduction of respective EU regulations in several areas since most of the domestic transport companies would not

survive international competition. The technical level of the infrastructure and most of the transport vehicle fleet is low. The implementation of the required maintenance work and overall modernisation efforts may be considerably hampered by the lack of resources and adequate financing tools. Society's ignorance of the environmental damage caused by transport also constitutes a major problem.

4.8. Incomplete institutional changes: the heavy burden of the state budget system

Even in the middle of the 1990s, the level of budgetary expenditure was 10-15 percentage points higher in Hungary than that of the developed countries at an average of 40-45 per cent. The Hungarian economy was therefore disproportionately dominated by the state budget system. At the beginning of the 1990s the budget deficit grew at an increasing rate while the GDP declined sharply. It became evident that in spite of the heavy tax burdens the deficit could no longer be financed at such a high level of budgetary expenditure.

No consistent reforms were carried out in the state budget structure during the first decade of transition despite a growing realisation of the problems. As a result of repeated attempts in several important sub-systems, some reform measures were introduced but were also withdrawn in some cases. The reform measures led to the establishment of four state budgetary sub-systems. In addition to the already existing central budget and earmarked state funds, the social security fund and the municipality budgetary funds were created to function independently of the central state administration. Since 1998, however, some of these changes have been reversed or slowed down. Most notably, the pension reform cannot go ahead as it was enacted in 1997. In a similar vein, the management of the social security funds was also 're-nationalised' in 1998, among the very first measures of the new government. Higher education fees were also abolished, and transfers re-introduced, regardless of income, by the new – apparently right-wing – government.

Municipalities were given a broad autonomy by the political changes in the early 1990s. In practice, however, their economic independence is severely limited since their revenues are not sufficient to cover all the costs they are obliged to do so by various laws regulating their responsibilities, e.g. providing education, health service, transport and other local and regional services. The dependence on the state is overwhelming in the current financing system due both to the level of central financial support and

the frequent changes in the rules regarding its allocation. Thus quite a few municipalities are forced to sell their assets to finance their short-term expenses, or, more recently, nurture rather close contacts with the government so as to obtain extra funding through various schemes, and thus losing their autonomy.

Although there is an apparent agreement on the principles and objectives regarding the reform of the state budgetary system, each step towards the advancement of the process has led to clashes of interests in both the professional and political arena. The most important goals include the further rationalisation of the role of the state, the expansion of the scale and scope of individual and local autonomies and the achievement of a more efficient operation of the social transfers system.

4.9. Regional differences

Despite Hungary's small size there are significant differences in the degree of development between the regions. The weight of the central region, especially that of the capital, in the economy is superior, and still continues to increase. Per capita GDP in Budapest exceeded the country's average by 80 per cent in 1994, 85 per cent in 1996 and 86 per cent in 1998. Budapest's contribution to GDP amounts to around one-third of the total.

The favourable economic trends taking during the large-scale restructuring of the 1990s primarily benefited Budapest and Western Hungary whilst the unfavourable changes added to the problems of Northern Hungary and the Eastern part of the country. These two trends resulted in a widening gap between the more and less developed regions. Development in each of these regions during the past decade has resulted in a slight improvement in the situation. However in practical terms this improvement only serves to keep the gaps between the regions unchanged and prevents a further relative decline of the less developed parts of the country.

5. MACRO VISIONS AND POLICY RECOMMENDATIONS OF TEP

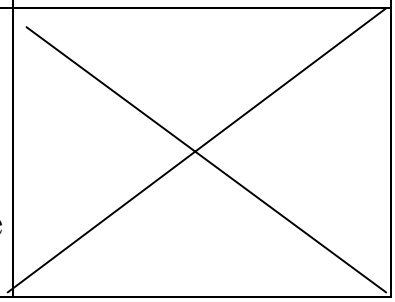
5.1. Three Macro Visions

TEP macro visions for the future take into account the results of the transition process so far, the current socio-economic challenges (as summarised in Sections 3 and 4) and the changing global environment. Having discussed a number of possibilities at Steering Group meetings and various

workshops with experts, eventually 3 scenarios have been elaborated.[17] The time horizon of the first two ones is 20-25 years, and that of the third one is considerably longer, namely 40-50 years. All three scenarios are based on the assumption that neither internal nor external conditions will force Hungary off the road of a multi-party democracy and a market economy. These can be depicted as cells in a two-by-two matrix, where the columns represent whether Hungary actively pursues a firm, well-designed strategy, and the rows describe if there are fundamental structural changes in the global context, including the ways and means of decision-making at international organisations and multinational corporations *(Figure 2)*.

Figure 2

THREE MACRO VISIONS

	Active strategy	**Drifting (no strategy)**
No major changes in the global settings (values, norms, and operation of large corporations and major international organisations)	*Co-operative partnerships:* Hungary implements an active strategy characterised by strong integration, based on mutual benefits and high level of knowledge-intensity	*Drifting:* Hungary, having no strategy, is 'grabbed' into the current system of the international division of labour along a low-skills, low-wages path
Fundamental, structural changes occur in the global settings	*Alternative development:* Hungary is integrated into a new, 'green' world by pursuing an active strategy along a knowledge-intensive way	

The fourth logically possible option – Hungary is drifting on the sea of fundamental global changes – was not drafted at all, because the other version of drifting was seen gloomy enough, and also hoped to be a sufficiently 'loud wake-up call'.

[17] A group of experts – co-ordinated by Anna Vári and László Radácsi – drafted these scenarios in September-October 1998, which were then discussed in November 1998 – February 1999, and revised extensively. Scenarios describing the potential developments of the neighbouring countries, broadly defined, were also developed and discussed in several rounds by the autumn of 1999.

Hungary is already extensively involved in the international division of labour, through ownership structures and via trade links. The country has become a full or associated member of the most important international organisations. All these macro scenarios assume that Hungary remains to be integrated into the international division of labour, as she is already part of the global and European economic and political systems. In other words, the possibility of isolation(ism) was excluded.

However, the form of integration is decisive, and hence the variable '*activity*' (or '*strategy*') deserves special attention. The actual content of this variable is determined by the intensity and quality of the activities of the civil society, businesses and the government (including the motivations and objectives driving their actions) as well as the interplay among these players. In other words, this variable is understood here as what is done (rather than what is planned).

Knowledge-intensity is perhaps the most important feature of these macro visions. Yet, it is not represented by a separate axis in *Figure 1* because it depends on the actual 'strategy'. Specifically, active strategies pursuing a path of low knowledge-intensity (and thus low value-added, low wages, weak local markets) as well as drifting along a knowledge-intensive path would be inconsistent, and thus were excluded from scenario building.

Macro visions took into account the current internal and external conditions and trends, and highlighted the most important elements of a process leading to a given future. Finally, they describe these alternative future states along the following dimensions: human resources (education, skills, capabilities, health); values; social strata (solidarity vs. polarisation); the development and role of civil society; environment; economic developments; physical infrastructure; energy. Given space limits, only their major features are summarised below.

5.1.1. Co-operative Partnerships

In this scenario, Hungary adopts an active strategy, based on mutual, shared benefits with her foreign partners, and becomes more closely integrated into the world economy along a development path of high knowledge-intensity. The pillars of this strategy are: significantly increased support for knowledge generation and exploitation; high priority for health and environment; and strengthening solidarity and social cohesion. In addition to active government policies, the close co-operation between governmental institutions, civil organisations and business communities play a crucial role at national, regional and local level. These lead to a signifi-

cantly improved quality of life and allow Hungary to catch up with the medium-developed countries.

5.1.2. Drifting

In this scenario, Hungary becomes increasingly integrated into the global economy over the next 20 years, and joins the European Union. However, due to the lack of an active government strategy Hungary's present semi-peripheral position is reinforced. This trajectory is, at best, of a medium level of knowledge-intensity, which, in turn, leads to an increasing foreign policy and economic dependence, and to a gradual loss of the ability to influence social trends. Hungary is unable to fully exploit the opportunities of international co-operation, especially those offered by the European Union. The net results are a rapidly widening development gap internationally and significantly deepening social divide internally.

5.1.3. Alternative ('green') Development

This scenario presumes that a fundamentally new way of thinking and value system becomes dominant in the world in some 40-50 years (as opposed to the 15-20 year time-horizon of the previous two visions), whereby a socially and ecologically sustainable globalisation prevails, based on co-operation. Technological developments are modest, appropriate, harmless, small-scale and prudent.[18] The Hungarian civil society and the government prepare for these fundamental changes in advance. This trajectory leads to a new state of development, based on high quality education, new skills and cultural standards as well as the widespread use of sophisticated technologies.

5.2. Policy recommendations

Policy recommendations of the Steering Group aim at facilitating the first vision (*Co-operative partnerships*), emphasising the importance of an educated, flexible and healthy population and an appropriate, strong national system of innovation. (Fairly similar policies can promote the third vision, too. In other words, the major factor differentiating these two visions is the nature of global settings, and not the aims and tools of the domestic policy). Of course, panels' and Steering Group recommendations should be

[18] It worth emphasising that this vision was drafted just before the first major demonstration against the current form of globalisation in Seattle in November 1999.

understood as equally important elements of an integrated policy 'package' (altogether more than 100 policy proposals).

The Steering Group recommended that policy-making should be accelerated and actions to be taken in three main areas. The following pre-requisites should be achieved in order to close the development gap:

- an educated and healthy population (prepared for life-long learning, flexible in the ever-changing environment, co-operative and open to new ideas and different value systems)
- a clean and healthy environment, and
- a strong national system of innovation.

These preconditions can only be established by if relevant long-term programmes are devised and consistently implemented. The other essential pre-requisites of the catching up process are the development of the info-communication and transport infrastructures and the improved competitiveness of companies (dealt with in detailed way by the relevant TEP panels). These long-term programmes should span several parliamentary cycles and should be based on a broad political and professional consensus. The recommendations of the Steering Group and thematic panels provide the foundation for such long-term programmes.

The Steering Group of TEP formulated 22 recommendations: a general policy conclusion and 21 specific ones, structured along the above pre-requisites of catching-up. The SG report supports these proposals with key arguments and occasionally suggests some more specific, more detailed measures, too, but here only the recommendations are listed.

1. Hungary should embark on a trajectory on which the development of knowledge-intensive activities and the improvement of health for the next 15-20 years are faster than in the current medium developed countries of the European Union. In the meantime, socially, economically and environmentally sustainable development should become central to the value system, along with quality of life. Knowledge and performance (efforts) required to accomplish these goals should be rewarded. The catching-up process, however, should not lead to unbearably wide gaps between different social groups and geographical regions of the country. In short, it social costs cannot be prohibitive.

Educated and healthy population

2. The development of those skills and values and teaching the types of knowledge that are being increasingly rewarded by the global labour

market, together with the abilities necessary for life-long learning should be the major goal at all levels of education. The following skills are of special importance:

- the ability to learn;
- creativity and the realisation, definition and resolution of problems;
- the ability to filter huge masses of information as well as to acquire and exploit relevant information;
- communication skills and abilities (proper use of the mother tongue and a good command of foreign language/s/, use of up-to-date communication tools, etc.);
- the ability to co-operate, work in teams, often in a multicultural environment on multidisciplinary problems.

3. Teachers' wages should be increased radically, so as to catch up with the remuneration of those with comparable qualifications employed in the business sector.
4. Appropriate indicators should be developed, and a network of monitoring institutes should be put in place so as to measure the quality and efficiency of education and training in an objective way.
5. It is essential that the total expenditures (public and private ones) on education, as a ratio of GDP, should exceed the OECD average throughout the next decade.[19] To achieve this, Hungary should reach the top third of the OECD countries in terms of expenditure on education within the next five years and should maintain that position in the long run.
6. A comprehensive government programme should promote information society, by focussing on human resource development. The most important goals and tasks of the programme are as follows:
   - information technology (IT) 'literacy' should be improved in various groups of the population, particularly in the age group who can be economically active;
   - to counterbalance the low rate of diffusion of IT equipment in households, access to modern info-communication tools should be provided free of charge to as many people as possible in traditional

[19] The OECD average was 6 per cent in the middle of the 1990s which exceeded the same Hungarian indicator by half a per cent but this difference has since increased further.

and new public institutions (e.g. schools, libraries, museums and tele-houses);

- in the current transition period it is particularly important to provide basic education and re-training in IT for those generations who already left school. IT training courses for civil servants are also of significance. The continuous re-training of teachers in IT skills is of utmost importance;
- curricula development aimed at introducing new, interactive methods and IT tools should be encouraged, primarily for elementary and secondary schools. To this end research groups specialising in education methodology should be strengthened and their participation in international networks supported;
- it should be understood (and accepted) that to upgrade the IT infrastructure of schools and then maintain that in the long run requires substantial public funds continually;
- in order to take advantage of potential business and employment opportunities, secondary vocational training should be improved, as well as new tertiary forms of education introduced, in close co-operation with employers, in many cases through public-private financed partnerships. New, specialised education programmes should also be introduced in higher education.

7. The government is urged to commission a feasibility study on the introduction of 'education vouchers' to facilitate life-long learning.
8. A sabbatical system should be introduced for researchers working in higher education and public research institutes, providing the opportunity for one-year scholarships in every 5-7 years. New, government-sponsored incentives should be introduced to facilitate sabbatical leaves for researchers working for business R&D units.
9. The government is strongly advised to launch a 'Programme for a Healthy Hungary'. The time-scale of the programme should be 20-25 years, thus far exceeding the 4-year parliamentary cycle. It should also span several sectors, not concentrating exclusively on the healthcare system, be preventive and non-medicinal in its approach (by removing medical treatment from the focus of healthcare). The programme should concentrate on well-defined and clearly measurable goals such as solving the most serious public health problems and reducing the major risk factors (the ones causing the largest number of death in Hungary).

Clean and healthy environment

10. The diffusion of environmentally friendly products, services, methods and technologies should be considered a key aspect of economic policy-making. To this end, cleaner production should be promoted by introducing the appropriate legal and economic conditions as well as providing relevant information on new products and processes.

11. Hungary should pursue a pro-active policy when adopting international environmental regulations. This policy should be based on a continuous monitoring and assessment of international trends.

12. Environmental awareness should be raised by:
    - establishing environmental centres to formulate complex environmental protection programmes and promote environmental education and training;
    - emphasising this concept when training teachers and accordingly strengthen the curricula in the relevant segment of higher education, especially for those who would specialise in teaching natural sciences and technical subjects;
    - launching programmes that encourage the population to be sensitive to the environment, and promote material- and energy-conscious way of life;
    - strengthening the communication and co-operation between businesses, the government and the civil society. The government has to play a leading role here.

Strong national system of innovation

13. Both public and private efforts are required to strengthen the national system so as develop a knowledge-driven economy and thus to accelerate the catching-up process.

14. Measures aimed at strengthening the national system of innovation should be based on the following considerations:
    - academia-industry co-operation and mobility between research/ higher education and the business sector should be encouraged. Special attention should be paid to this aspect when devising government R&D schemes and granting scholarships;
    - the adaptation process of the Hungarian higher education should be accelerated, co-operation between the research institutes of the Hungarian Academy of Sciences (HAS) and the higher education, on the one hand, and between the higher education and businesses, on

the other, should be strengthened. It should be a widespread practice in five years for higher education institutions to play an active role in knowledge transfer, too, in addition to their more traditional responsibilities in education (knowledge transmission) and research (knowledge generation). The commercialisation of knowledge generated in the higher education institutions and the research institutes of the HAS should be encouraged. In this regard special attention should be paid to spin-off firms (i.e. setting up small, technology and knowledge-intensive enterprises) and to international research consortia (joining these networks as strategic partners);

- Particular attention should be paid to the development of knowledge transfer institutions, e.g. information and industrial competence centres, technology incubators as well as research units (and other types of organisations) based on government-industry-academia co-operation.

15. Priority should be given to the following objectives in order to increase the efficiency of public R&D expenditures:
    - the bulk of the increasing public R&D expenditures should be devoted to trigger business R&D expenditures;
    - the physical infrastructure of domestic R&D should be developed rapidly, by encouraging private investments, too. A high priority should be given to improve the quality of R&D instruments and the info-communication infrastructure so as to reach the level of the advanced European countries.
16. The Government should submit a comprehensive report to the Parliament in 2001 on the indirect (market-type) incentives to promote innovation performance, comparing them with the practice of OECD countries. The report should also include a medium-term development strategy and a schedule of legislative actions concerning this issue.
17. In 2001 the Government should assess the impacts of the venture capital law of 1998 and take appropriate measures to encourage a significant increase in venture capital investments into innovative projects.
18. A well-devised public procurement policy should also be used to boost demand for technology-intensive products and services. The most important areas are education, healthcare, public administration and defence.
19. When setting long-term research priorities the interests of narrow scientific fields should not dominate the process. The effective operation

of the national innovation system requires knowledge transfer in a wide range of scientific fields, and thus none of the fundamental scientific disciplines can be ignored. Contemporary scientific research lays the foundation for tomorrow's applications (technologies), rather than today's.

20. In the medium term, taking into account the major international trends and national strengths, particular importance should be given to significantly improve the indigenous innovation capabilities in the following two areas:
    - life sciences (including biotechnology);
    - information and communication technologies.

21. The current, vertically structured, decision-making system of the Government should be reshaped in order to provide adequate responses to the major challenges, which are becoming increasingly horizontal in nature.

22. To provide better foundations for innovation policies, the Government should introduce methods that are widely applied internationally in the field of innovation, and hence should establish an adequate institutional network. The following government measures should be taken:
    - a feasibility study should commissioned, in co-operation with the Parliament, on setting up a technology assessment institution in Hungary;
    - the establishment of a science and technology observatory to monitor the national R&D and innovation efforts and performance, in accordance with the OECD standards, i.e. providing internationally comparable figures. (It should be financed by the government, but its professional autonomy should be safeguarded by strong legal guarantees, requesting to meet the international norms and standards in its analyses as a fundamental way of control.)
    - the establishment of an organisation – together with the Parliament or the President of the Republic – to evaluate higher education and public R&D programmes regularly, assessing the efficiency of public spending in these fields, applying international norms and involving highly respected foreign experts.

6. DISSEMINATION, IMPLEMENTATION AND IMPACTS

6.1. Policy Consultations, Implementation

Preliminary TEP results were disseminated and discussed at workshops and through the Internet already in their first draft forms. The final reports, including policy recommendations, were discussed by parliamentary committees, and were received favourably; e.g. some of these committees (e.g. the ones on Health, Education and Environment) specifically asked the responsible ministers to form task forces to analyse how to implement policy recommendations put forward by TEP panels.

Panel reports were also discussed at face-to-face meetings with government officials responsible for devising strategic plans of ministries. Some of them expressed their willingness to incorporate certain TEP proposals into their own policy documents (e.g. Ministry of Environment, Ministry of Transport and Water Management, Office for Government Commissioner in charge of Information Technology). A new Health programme – co-ordinated by a former member of the Health and Life Sciences panel of TEP – was launched in 2001 by a newly appointed minister who used to be a member of that panel, too. Finally, a new scheme, aimed at human resource development for R&D – and fairly similar to a Steering Group recommendation (No. 8), namely granting a sabbatical year for scientists and engineers working for companies – was launched in 2002 by the Ministry of Education.

Although it might be still too early to draw any conclusion on the speed and efficiency of implementation, a quicker, more co-ordinated implementation seems to be desirable.

6.2. 'Process' Results: Workshops, networks and new ways of thinking

It is difficult to separate 'products' from the 'process', because the Steering Group, the panels, the Delphi respondents and the workshop participants (i.e., altogether several thousand industrialists, academics and government officials) all contributed to the 'products', that is, written, codified results. Without a lively and constructive, creative process a high-quality 'final product' cannot be produced, on the one hand. Without inspiring 'semi-finished products' – background papers, draft visions and reports –, on the other hand, the 'process' cannot be triggered at all. Experts would not attend workshops were they not able to benefit from the process (e.g. in the form of learning and/or joining new networks).

The process in itself was a very important 'result'. For instance, more than one hundred regional workshops were organised by the end of 2000 to discuss the Delphi-results, background papers, draft visions and policy proposals. These workshops are likely to have contributed to the strengthening and re-focussing of existing co-operation and communication among different communities. The extent to which these new fora were useful, however, is very difficult to measure in an exact way.

Yet, there are clear signs of new ways of thinking. One example is that the policy recommendations of TEP took into account the complex, 'multi-sectorial' nature of crucial issues, e.g. health, environment, info-society. Moreover, non-panel-member experts also understood the significance of these new types of policies, and were willing to 'subscribe' to them – as both the policy workshops and the results of the Delphi-survey have shown.

Neither the Steering Group nor the TEP Office influenced the panels in any way as far as the actual content of the statements is concerned. No guidelines were issued as to their nature – technological vs. non-technological – either. If anything, the almost exclusively technology-oriented Japanese and British questionnaires could possibly affect the panels when formulating their actual statements. Moreover, most of them not policy analyst or social scientist were, but technical experts. In this regard, it is worth highlighting that the number of statements dealing with non-technological issues exceeded that of the technological ones.[20] Moreover, this approach has been validated by the respondents: half of the 'top 10' Delphi-statements – those deemed to be the most favourable ones by the respondents, i.e. with the highest combined socio-economic and S&T impacts – are non-technological in their nature. *(Table 6)* It proves beyond doubt the importance of human resources, regulation and institutions, that is, the salient relevance of an innovation system approach in a transition country: even those who have not been influenced by the panel discussions, answered the questionnaire by realising the significance of these issues. This result is even more striking when juxtaposed with the currently re-animated linear model of innovation by some Hungarian policy-makers. (Havas, 2001) The majority of respondents – mostly technical experts (Ha-

[20] It was only possible to categorise five panels' statements, using the British typology (elucidation, prototype, first practical use or widespread practical use of a product) as a starting point. Even in these cases a number of categories had to be added, e.g. human resources, organisational innovation, regulation, institutions, as panels followed a context-specific logic. Yet, the remaining two panels (*Human resources*, *Natural and built environment*) were so far away even from this 'relaxed' classification, that it did not make sense to include their statements in this exercise.

vas, 2000), and not social scientists attracted to some 'fluffy' theories on the importance of networks, co-operation and institutions, etc. – put as much weight on these non-technological issues as on the technological ones.

Table 6

Technological vs. non-technological Delphi-statements
(number of statements)

Types of statements	**Health**		**IT, telecom, media**		**Manuf, busin. Processes**		**Agri-busin., food**		**Trans-port**		**Total**	
	A	*T*	A	*T*	A	*T*	A	*T*	A	*T*	A	*T*
Elucidation	9	-					2	-			**11**	-
First practical use	2	-			22	-	11	*1*	11	*3*	**46**	*4*
Widespread practical use	12	*2*			26	*4*	38	*6*	24	*5*	**100**	*17*
S&T developments			15	*4*							**15**	*4*
Risk factors	12	*7*									**12**	*7*
Human resources	10	1			8	-					**18**	*1*
Institutions	12	-							6	-	**18**	
Regulation	8	-	6	-	2	-			3	*2*	**19**	*2*
Services in Hungary			9	*3*							**9**	*3*
Future services			15	*2*							**15**	*2*
Information society			7	*1*							**7**	*1*
Organisational innovation					20	*6*	16	*1*	11	*1*	**47**	
Others					4	-	12	*2*			**16**	*2*
Consumers' behaviour							16	-			**16**	
Total technological	**23**	*2*	**15**	*4*	**48**	*4*	**51**	*7*	**35**	*8*	**172**	*25*
Total non-technological	**42**	*8*	**37**	*6*	**34**	*6*	**44**	*3*	**20**		**177**	*25*

Legend: A = all statement; *T* = Top 10 statement; [■] = counted as technological statement

A real challenge is to convince policy-makers to implement these policies, based on a new type of analysis. This is going to be more difficult than reaching consensus in a professional community. The learning process as a whole still has to be completed with this 'lesson'.

It also seems that a better understanding of the relationship between technological and non-technological factors influencing the quality of life and competitiveness evolved. This is explicitly reflected in the reports – especially in the policy recommendations, see *Table 7* –, and was discussed at some workshops.

Table 7

Six panels' recommendations by type
(number of recommendations)

Improving human resources	6
Others	7
Application of IT tools	8
Finance*	11
Sector-specific or general policy	15
R&D priorities, innovation policy	17
Institution-building, legislation, regulation	19

Note: Based on a somewhat arbitrary grouping and classification of panels' policy proposals. One panel (*Human resources*) had to be excluded because of the very specific nature of their recommendations.

* Mainly the application of new methods, e.g. public-private partnership

However, there is a need for a systematic evaluation, conducted by independent experts, in order to establish what process-type results and benefits have been achieved, and what should be done to improve the efficiency of the foresight process in the next phase of TEP.

7. CONCLUSIONS

Decision-makers face increasingly complex issues, given that economic, technological environmental – and thus social – challenges are brought to any nation sate rather quickly, due the forces of globalisation, and these challenges are usually inherently interlinked. Technological changes cause

economic, environmental and social threats and opportunities; economic resources are required to finance public policies aimed at tackling these issues (e.g. harnessing technological change, preventing environmental crises, preventing social explosions, etc.); and government policies are under ultimate social control (in democratic societies trough a number of institutions, formal and direct, as well as informal and indirect ways, in other cases by more costly, more radical, yet, less frequently applied mechanisms). These trends cannot be arrested at the Hungarian border either, but on top of them, a number of local challenges (economic, political and social psychological heritage of planning, the Herculean tasks of transition) are also added to the pressure. National strategies cannot ignore the complexities of economically, socially and environmentally sustainable development either.

Foresight processes can assist decision-makers in this complex environment to reduce technological, economic or social uncertainties by identifying various futures and policy options, make better informed decisions by bringing together different communities with their complementary knowledge and experience, obtain public support by improving transparency, and thus improve overall efficiency of public spending. TEP, the Hungarian Technology Foresight Programmes showed that it is an especially useful tool to identify challenges and developing visions in a transition country.

Its main aims were to *identify new market and technology opportunities* and devise adequate responses in order to *achieve long-term competitiveness,* and *improve quality of life*. These ambitious goals can only be achieved if researchers, business people and government officials join intellectual forces to assess Hungary's current competitive position and impacts of likely global market and technological trends. Hence their realigned and re-invigorated relationships can be regarded as a means of the principal goal. However, the process in which these experts with different backgrounds communicate and share ideas about longer term issues, generate consensus, and co-operate with increased commitment in devising and realising a national strategy, seems to be so crucial that it was an end in itself. In other words, the programme was also aiming at strengthening the formal and informal relationships among scientists and engineers, managers and civil servants, alike spreading the co-operative and strategic thinking.

Hungary had already been preparing to join the European Union when TEP was designed. Accession to the EU is likely to shape Hungary's future

to a significant extent, and it thus requires a clear and sound vision about Hungary's role and opportunities in the enlarged European Union. It was expected that TEP would contribute not only to the *accession* itself, but also to the *integration process* by providing visions and diffusing new decision-making methods, as well as fostering changes in norms, attitudes and behaviour.

It was also anticipated that the results – and in the case of the participating business people the foresight process itself – would also assist Hungarian firms in devising and implementing strategies to improve their competitiveness.

The above analysis showed that TEP results were perceived favourably by the relevant standing committees of the Parliament, and a number of ministries also relied on TEP recommendations when devising their own policy schemes. Yet, the implementation could have been faster, more extensive and better co-ordinated with a stronger political support.

Delphi-results (the unexpectedly high weight of non-technological statements among the so-called top 10 statements), the composition (complexity) of the panels' and Steering Groups policy recommendations, and the discussions at a number of workshops proved that a new way of thinking has also spread. In other words, significant process benefits have been achieved.

Yet, there were also a number of unforeseen difficulties, which might provide useful lessons – or warning – for experts preparing or managing vision-building exercises in other countries. Initially rather strong resistance was shown to the new way of thinking required for developing scenarios. Two reasons might explain this opposition. First, it was openly stated that "being scientists, we should think about the future in a scientific manner, and apply scientific methods to identify the optimal future"; hence, there would be no need for alternative visions. The other, more context-specific, and less vocal reason relates to the legacy of central planning, which did not promote thinking in terms of alternative futures. (Central planning actually was very much in favour of the old paradigm of futures research, i.e. extrapolation based on trend analysis.) Plans only had 'optimist' and 'pessimist' versions of a single, 'socially optimal' future. Influenced by this legacy, most TEP participants could only think of 'optimist', 'pessimist' and 'business-as-usual' scenarios at the beginning of TEP.

Seen from a different angle, the initial problems of applying the scenario technique showed the endurance of the planning 'mode' in people's mindset; it was therefore an important means of breaking away from previ-

ous ways of thinking about the future. Yet, probably not all the participants fully grasped the difference between planning and vision building. (Discussions at various international foresight workshops have also clearly shown that without being involved in actual scenario-building exercises it is rather difficult for some policy-makers to understand this difference, in other words the use and relevance of visions about qualitatively different futures.)

Further general methodological and policy conclusions can also been drawn from the experience of TEP. It has shown, that foresight can be relevant even in a small country, which is not in the forefront of technological development but rather in the semi-periphery. A number of factors seem to contradict this conclusion at first glance. Foresight is costly in terms of time and money, but even more so in terms of the participants' time required by meetings, workshops and surveys. Moreover, advanced countries, whose experts, in turn, know more about the leading edge technologies, regularly conduct their foresight programmes, and their 'products' – reports, Delphi-survey results – are readily available. Yet, only a national programme can position a country in the global context and spark a discussion on how to react to major trends. Similarly, SWOT of a given country would not be analysed by others, let alone broad socio-economic issues. Process benefits cannot be achieved without a national programme either. Without these, a country would not be able to improve the quality of life of her population and enhance her international competitiveness.

The current structural changes in the world economy and the emergence of new, global concerns related to environmental, health and demographic issues, imply that the scenario method may be relevant not only in transition countries, per se, but also in countries with long-established, crystallised institutional systems. A growing body of literature suggests that technological and socio-economic changes are intertwined. Scenario workshops, therefore, can contribute to a better understanding of these complex relations, leading to policy proposals, which help in making appropriate choices in an increasingly complex environment. As TEP has shown, technical experts are aware of the importance of non-technological issues (human resources, institution-building, legislation, regulation, organisational innovation). Also, taken alone, the Delphi-method can facilitate the foresight process only to a limited extent, and thus the process benefits are bound to be limited, too.

The other dilemmas disclosed by TEP are partly to do with policy, and partly methodological in character:

- how to solve the inherent contradiction between the long-term nature of foresight issues (policy recommendations), on the one hand, and the substantially shorter time horizon of politicians (and some policy-makers), on the other;
- what organisational set-up is necessary to ease another inherent contradiction between the need for a strong (but 'reserved') political support (or 'embeddedness') for a foresight programme on the one hand, and intellectual, organisational, financial independence from any government agency, on the other;
- how to overcome the departmentalised government structures when policy proposals tackling complex issues (such as health, quality of life, environment, competitiveness, etc.) should be discussed and implemented, i.e. public resources – both financial and intellectual ones – should be pulled together to make a real difference in an efficient, that is, co-ordinated way, yet, they are allocated to different ministries and other government agencies?

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APPENDIX

Examples for alternative futures/ visions developed by TEP panels

HEALTH

	„Health-oriented, multi-sectoral"	**„Restrictive, efficiency-oriented"**	**„Profit-oriented, driven by suppli-ers' interest"**
Condi-tions	Conscious governmental policy, long-term professional programme	State supply: uni-form, cheap, equally available	Minimal role of the state (regulation + public health)
	Public expenses: 5.5-6.0% of GDP, private spending: 3.0-3.2 %	Reduced public ex-penditures → limited health services	Health expenditures: ~ 10 % of GDP Deepening gap between the poor and rich
Results	Public finance dominates	Rate of public finance: 60-65%	Increasing role of private finance
	Priority: prevention	Meet non-financial requirements: ambulance, epidemic control, international regulation	Preservation of health is not a priority
	Basic health services for all	Limited services by the state, need for private finance	Fixed-price services predominate

IT, TELECOMMUNICATIONS, MEDIA

	„Tiger”	„Sparrow-hawk”	„Dinosaur”
Technological trends in Hungary	Continuos, well-balanced development	Continuous, well-balanced development	Slow technological development, lack of convergence
Global environment	Favourable conditions	Strong influence of global players in Hungary	Favourable, but hardly any impact in Hungary
Role of the state	Active, promotes development	Passive, weak	Passive, weak
Impacts	EU-conform regulation	National cultural heritage threatened	Economic and technological isolation
	Integrated ICT networks	Widening economic gaps between regions	Size advantages are not ceased

	„Garden Hungary”	„Drifting”	„Green alternative”
Overall features	Shift to vegetables, fruit, bio-cultivation	Grain-meat chain predominates	Socially & ecologically sustainable system
Integration	Local and global actors, mutually beneficial co-operation	By the pressure of the world market	High-level international collaboration
Knowledge-intensity	High + wide-ranging	High, but only in a small circle	High + wide-ranging
Activity/ strategy	State + farmers' co-ordinated responsibility	Low, foreign actors dominate	High: state + civilian self-organisation
Results	Increasing employment	Fewer market players	Priority: employment + environmental farming
	Most dynamic development	Increasing efficiency in a shrinking agribusiness	Efficiency is subordinate to environmental and social aspects