The competitiveness of Central European IT Exporters: Can this sector attract Western Investment?*

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This essay reports the results of a survey of IT exporters from Poland, Hungary, Romania, Bulgaria and the Czech Republic. The survey identifies the key competitive advantages and disadvantages of Central European IT companies as they compete for outsourcing work in the US and Western European markets. The results of the survey are then interpreted in the context of data on the development of IT environments, markets and sector investment in the region. We find that unlike key competitors' governments the Central Europeans have not pursued policies of supporting their infant IT exporters, which are small and underinvested. The paper proposes a set of measures that should be taken if needed Western Investment is to start flowing into the export oriented IT sector.

Die vorliegende Studie berichtet über die Ergebnisse einer Umfrage unter IT-Exporteuren aus Polen, Ungarn, Rumaenien, Bulgarien und der Tschechischen Republik. Die Umfrage streicht die massgeblichen Wettbewerbsvor- und -nachteile oseteuropäischer IT-Firmen heraus, die ins Spiel kommen, wenn sie um Outsourcing-Verträge konkurrieren. Die Ergebnisse der Umfrage werden dann im Zusammenhang mit Daten über den IT-Markt und der regionalen Investitionstätigkeit interpretiert. Im Gegensatz zu den Regierungen von Konkurrenznationen haben osteuropäische Regierungen es versäumt, ihre jungen IT-Exporteure zu unterstützen, die klein und finanzschwach sind. Diese Studie schlägt mehrere Massnahmen vor, die dem IT-Exportsektor Investitionen verschaffen können.

Key words: Information technology, outsourcing, business associations, policy advice, infant industry

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Introductory remarks

In the information age the prosperity of countries and regions of the world will increasingly depend on their ability to be high value added contributors to the international information economy, rather than just being passive IT consumers. Today's competition among nations is very much becoming a race about who is best prepared and equipped to succeed in the global information economy of the future.

In the past decade the countries of Central Europe – especially the Visegrád four of Hungary, Poland, the Czech Republic and Slovakia – have made great strides towards creating viable market economies. They have had to struggle with multiple challenges of privatization, restructuring as well as meeting the many standards for joining the European Union. Opening up to Western investment has enabled them to quickly improve their telecom infrastructure and also to create a relatively modern IT infrastructure through imports of hardware and software.

In many respects the more advanced countries of Central Europe (Poland, Slovakia, Czech Republic and Hungary) are well positioned for the information age: they enjoy high adult literacy rates and high numbers of scientists and engineers in R&D. They have relatively strong technical universities and traditions of excellence in mathematics (Poland) and engineering (Czech Republic). They have also made great strides towards closing the gap with advanced nations as regards telecommunications. After ten years of painful economic reform, the Visegrád four now have functioning market economies with large private sectors open to foreign trade and investment.

However, the creation of market economy institutions has not automatically assured a sufficient reallocation of resources to allow all the Central European countries to catch up with high income OECD nations with respect to information technology. Table [1] below summarizes the positions of the countries of Central Europe on key indicators used by the 2002 World Bank Knowledge Assessment System (Table [1]). For comparative purposes data for Finland has been included. Although Finland's population is only 5.2 million, the size of its economy is in the same league as that of Poland, and Finland is considered a leader in IT adoption, ranked number 3 in the Information Society Index 2000 (Table [1]). Thus Finland could be a role model of development for the countries of Central Europe. The data assembled in Table [1] allows for some overall assessment of the position of Central European countries in the IT race.

Notable is the success of policies allocating sizable investment to the telecom sector and the good results achieved in bringing up the number of telephones per 1000 people. The number of computers within society as well as that of Internet hosts is still considerably behind world leaders, but according to market estima-

tes is growing sharply[1]. There are also positive trends in the development of e-commerce, with Poland and the Czech Republic catching up quite rapidly with the OECD leaders. The Information Society index ranks the countries as follows: The Czech Republic is ranked 27, followed directly by Hungary at 28. Poland is ranked 30, Romania 31 and Bulgaria 36 (Table [1]).

Looking at longer term prospects, what appears quite disturbing is the insignificant private sector spending on R&D (which is only half of the corresponding percentage spent by Finland) and, with the notable exception of Hungary, the dismal performance of Central European countries as exporters of high technology products.

Closing the technology gap will require a sustained investment effort by the countries of Central Europe. In terms of IT spending per capita they are well behind – spending on average 25% of what Western Europe spends (European Telework Online 1999).

In our investigation we started from the position that to succeed in the world information economy it is insufficient to be a passive consumer or user of technology (although having the basic infrastructure is a prerequisite to integraion). For this reason from the various dimensions of the information economy we chose to focus on the question: Are the Central European private sector companies actively present in international markets for outsourcing services?

Table 1. Key Economic and Technological Indicators for Eastern Europe and Finland

	Finland	**Bulgaria**	**Czech Republic**	**Hungary**	**Poland**	**Romania**	**Slovakia**
Intellectual property is well protected [1)]	6.4	3.0	4.4	4.3	3.8	3.5	3.8
Technology Achievement Index [2)]	0.74	0.41	0.47	0.46	0.41	0.37	0.45
Researchers in R&D 1998	13995	13976	12220	10990	52962	31901	9330
Availability of venture capital [3)]	5.5	2.6	3.2	3.6	3.0	1.3	2.8
Private sector spending on R&D [4)]	5.8	2.7	4.0	4.1	3.9	2.3	3.6
FDI as a % of GDP 1990-1999	1.97	2.01	3.5	4.54	2.39	1.59	1.18

[1] See for example Polish Internet Arena, www.i-start.pl.

	Finland	Bulgaria	Czech Republic	Hungary	Poland	Romania	Slovakia
High Technology exports as % of manufactured exports, 1999	24	4	9	23	3	4	5
Indicator of Telephones/1000 people, (incl. mobiles), 1999 [5)]	7.15	6.09	6.69	6.5	6.12	5.66	6.32
Natural log of Computers/1000 people, 1999	5.89	3.28	4.67	4.31	4.13	3.29	4.7
Rating of Computer processing power as % of total world wide MIPS (millions of instructions per second)	0.54	n/a	0.19	0.21	0.49	n/a	n/a
Internet hosts/10,000 people, 2000	7.22	2.99	4.91	4.87	4.22	2.66	4.26
Information Society Index (2000)	3	36	27	28	30	31	n/a

Source: World Bank Institute (2002) [6)]

[1)] Based on the statistical score of a large sample group in a particular country responding to the question of whether "intellectual property is well protected" in their country. (1=weak or nonexistent, 7=equal to the world's most stringent).

[2)] Composite index from the UNDP. Measures not which country is leading in global technology development, but focuses on how well the country as a whole is participating in creating and using technology. Finland holds the lead, followed by the United States and Sweden. See (UNDP 2001: 46-49).

[3)] Based on the statistical score of a large sample group in a particular country responding to the question of whether "entrepreneurs with innovative but risky projects can generally find venture capital" in their country. (1=not true, 7=true).

[4)] Based on the statistical score of a large sample group in a particular country responding to the question of whether "companies invest heavily in research" in their country. (1=is nonexistent, 7=is heavy relative to international peers).

[5)] Based on the statistical score of a large sample group in a particular country responding to the question of whether "intellectual property is well protected" in their country. (1=weak or nonexistent, 7=equal to the world's most stringent).

[6)] http://www1.worldbank.org/gdln/Programs/kam2002/technical.htm (Accessed 10/08/02) See for detailed information on the indicators.

Theoretical aspects of government support for "Strategic Industries"

Most authors agree that the IT sector is a "strategic future industry" whose development has critical importance to a country's ability to compete and prosper in the future economy. According to the OECD, "the ability to create, distribute and exploit knowledge is increasingly central to competitive advantage, wealth creation and better standards of living" (OECD 2001). The position of Central European economies with regard to the high technology sector in general and international knowledge services sector in particular can be described as catching up (World Bank 1998).

Two theories are relevant with regard to Central European IT sectors. The first is the theory of first mover advantage, as it captures the competitive pressures at work in the global IT markets. The second is the so-called "infant industry" theory, which may provide some policy options geared towards overcoming the hurdles late movers encounter.

The theory of first mover advantage has been applied not only to traditional manufacturing industries (Liberman and Montgomery 1988; Agarwal and Gort 2001; Aoki 1998; Robinson et al 1994) but also to international trade in knowledge based services. The most prominent example is the Indian software industry, especially as a destination for outsourcing (Arora and Asundi 1999; Arora et al. 2001; Banerjee and Duflo 2000; Joseph 1997; Singh and Nandini 1999). By pioneering the international outsourcing industry, by creating a large capacity, by building market power and an international reputation, the Indian outsourcing exporters have long enjoyed first mover advantage. Conversely, nations who are new entrants into the global software industry may face considerable obstacles when trying to establish themselves against the first movers (Heeks and Nicholson 2002).

Asian countries such as Japan, Korea, and Taiwan exemplify use of the infant industry argument, as they have applied protectionist measures to develop a national electronics and computer industry (Lee 1997; Das 1995; Bell et al 1984; Wade 1990; Jacobsson 1993). The development of the semiconductor and electronics industries in Japan and Korea has shown that the state can play a pivotal role in the emergence of internationally competitive industries (Shin 1997; Henderson 1998; Langlois and Steinmueller 1999). The "East Asian model" has often been quoted as a model for stimulating growth and development in developing countries (Wu 1991; Hayami 1998; Hong 1997; Fields 1995; Kuznets 1988). Asian countries such as Malaysia are now spending public money to support IT infrastructure and develop their IT industry (Bresnahan and Richards 1999). In the case of the Central European IT industry, one can argue that the IT export sector constitutes an emerging infant industry that should be considered for government support – if only on the basis that so many other governments spend funds to support their IT sectors.

Not all nations are qualified to successfully adopt these policies, but in the case of Central Europe some of the preconditions for success are in place: Education systems are good, the workforce is well-trained, and infrastructure is solid (Orenstein 2001). Still, few of the Central European countries have begun developing comprehensive and effective policies for government support of the IT Sector (OECD 2001).

Given Central Europe's low wages and geographic proximity, it could be a natural outsourcing destination for Western European businesses (Dulbecco and Vagneron 2001). Pfohl and Large (1993) examined some of the challenges faced by Western firms sourcing from Eastern and Central Europe. They identified the following key problems: finding reliable business partners, establishing quality control, insuring compliance with deadlines, and dealing with the legal systems in Central Europe. The countries continue to have a poor image in spite of the fact that in recent years the economic and political conditions in the region have improved. Source effects can be a significant barrier to business. But even this problem can be overcome as the cases of Japan, Korea and India demonstrate (Banerjee and Duflo 2000).

The survey and its findings

Between the months of July and November 2001, we conducted structured interviews with representatives of export-oriented Central European IT companies. As there is no exhaustive list of such companies, we had to locate potential respondents through incremental research. For this purpose, we contacted embassies, chambers of commerce, and other professionals. Our main sources of inforation were websites of IT-related business associations, export institutes, and annual rankings in technology magazines such as the *Polish Computerworld.* We then mined these lists for contact information. From these lists, we narrowed the firms down to those IT companies that appeared to export to either Western Europe or the U.S.

Contractors and team members fluent in one of the Central European languages then conducted telephone interviews with managers of these companies. Most managers preferred to answer the questions in writing. In these cases, the team members sent the questionnaire via e-mail.

The advantage of the search strategy we employed is that we came across those companies interested in international visibility. Therefore, we believe that with a few exceptions, our respondents are at the forefront of the export-oriented IT industry in Central Europe. The drawback of this strategy was a small sample size, as companies were difficult to locate, and then quite reluctant to respond either by pleading little time or by expressing concerns about confidentiality. The Bulgarian sample is the largest, since unlike in the other cases, the research contractor was in Bulgaria.

The dataset we gathered contains 22 observations: nine from Bulgaria, four from the Czech Republic, two from Hungary, five from Poland, and two from Romania. Among these, two companies – one Polish, one Hungarian – turned out to provide services to neither the U.S. nor Western Europe. Consequently, we eliminated these two observations.

Collapsing the country data into a regional data set allowed us to discern trends that are not visible when looking at the smaller country data sets. The reason for this is that the different Central European economies exhibit structural similarities, such as proximity to Western Europe, communist legacy of state involvement in the economy, and weak reputation. Because of these characteristics, companies across the region face similar constraints. Also, even though the number of observations is small, our research approach led us to interview the most prominent and thus most internationally oriented firms in the sector. Obstacles experienced by these companies are likely to constrain the progress of less competitive firms as well.

Export orientation still in its early stages

Companies that are export oriented are competing in a more demanding international marketplace. They need to perform at higher levels of quality than domestic firms. However, the sample data reveal that these efforts are still in their early stages. Even though we focused only on those firms that have at least some export experience in software products or services, the median number of years of selling outside the country was 3.5 years, and the median years selling to the US were even less at two years. Only four of the sample firms had U.S. sales offices (19%), and these have been in place for but a short time – a few years (Table [2]).

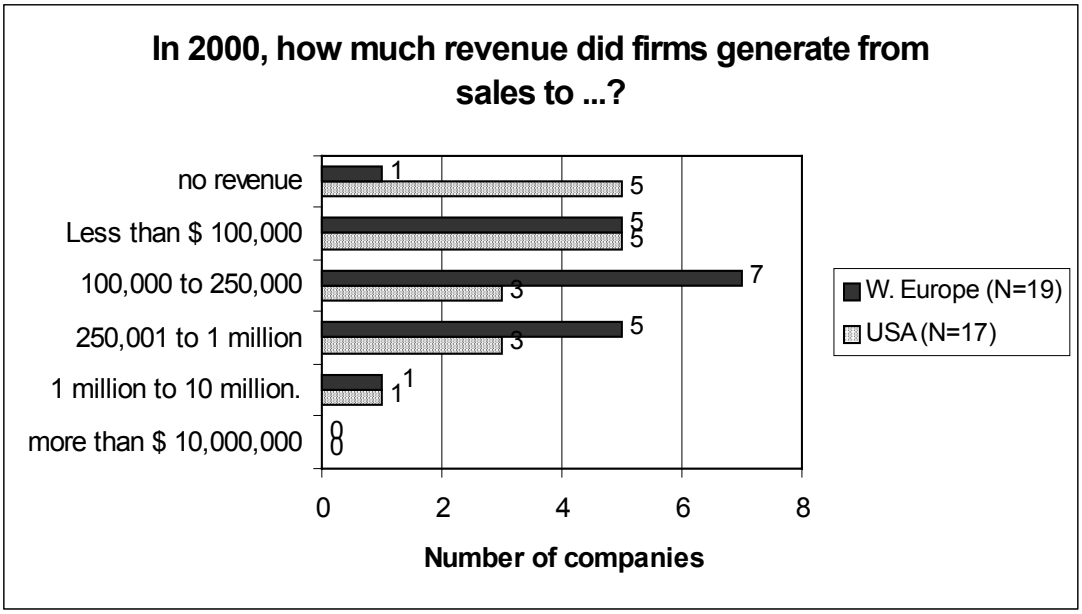
The magnitude of the region's firms' activities abroad is small. Only one firm is exporting more than one million dollars per year in software products or services to the U.S., another firm is exporting this much to Western Europe (Figure [1]). This is an industry that is young – across all these nations.

Table 2. Export activity of sampled firms. Years of activity abroad—frequency count. N=20

Years	Firms selling outside country	Firms selling in the U.S.	Firms with U.S. sales office
Not at all	0	5	16
Less than 1	1	1	0
1	2	1	2
2	2	5	1
3	5	3	1
4	2	0	0
5	3	2	0

6	1	1	0
7	0	1	0
8	1	0	0
9	1	0	0
10	1	0	0
11	1	1	0
Median	3 -4	2	0

Figure 1. Revenue generated from sales to Western Europe and the U.S.

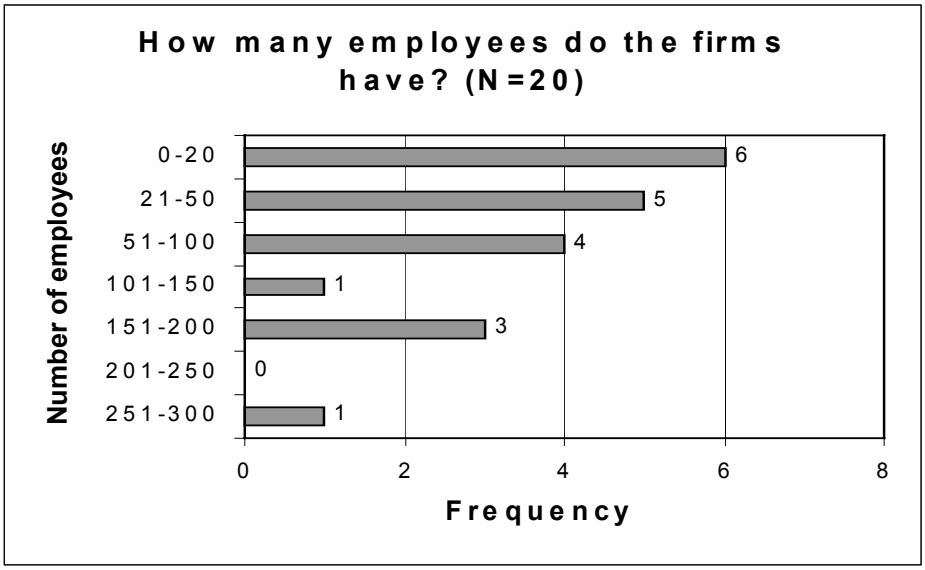


One of the implications is that many of the firms are small: They are small not just in terms of revenues, but in terms of employees as well: 55% of the sample firms had fifty employees or less (Figure [2]).

Nevertheless, these firms are making inroads into the global technology landscape. Many have well-regarded customers abroad. These include North American government agencies as well as global blue chip firms from the U.S. and Europe. Numerous other smaller firms were also noted.

There is a noticeable emphasis on business ties with Western Europe over the U.S. Out of 20 respondents, 15 are selling their services to the U.S., but 19 are selling to Western Europe, a 27% difference. A larger share of the firms' revenues comes from Western Europe over the U.S. The modal category is $100,000 to $250,000 of exports per year to Western Europe, with seven of 19 companies located in that category. For the U.S., the mode spreads over the "no revenue" and "less than 100,000" categories, with each having five observations.

Figure 2 Firm size measured by number of employees



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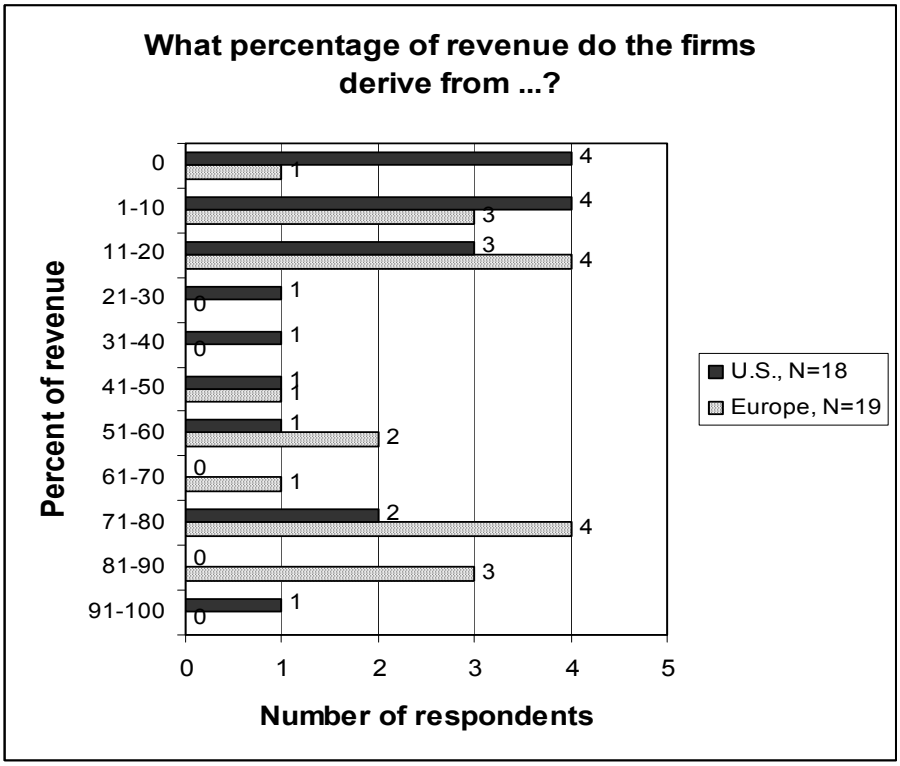
In Figure [3] we summarize the percentage of revenues derived from foreign activity in Western Europe and the U.S. Again, Western Europe is a more important source of revenues, impacting, in the median, 55% of revenues. On the other hand, regarding business with the U.S., the median result is that only 15 to 20% of revenues are derived from U.S. sales. An exception is one Bulgarian firm that derives 100% of its revenues from U.S. sales.

Of the 20 respondents, nine had three or more contracts with the U.S., two companies had two contracts so far. This gradual market entry is consistent with the median number of years the respondents have been selling abroad, 3.5 years. Of the 20 exporting companies we interviewed, four had sales offices in the U.S. – one company for three years, one for two years, and two for one year. Establishing a sales office is an expensive, but necessary, mode of market entry.

Figure 3 Revenue generated from sales to Western Europe and the U.S.



The overwhelming majority focuses on high-end tasks: new development of a fully integrated system, and new development of system components (Table [3]). These are the highest end tasks in software development using the definitions in our survey. Indeed, many of these firms develop their own products or design and build complete systems. Testing, maintenance and support, as well as design, are also services provided by around fifty percent of respondents. Also note that roughly the same services are provided to both the U.S. and Western Europe.

Table 3. Most important services provided

"What are the primary services your company provides for U.S. and Western European customers?" and "Which services were most important financially?"				
USA: services provided	USA: most important service	Western Europe: services provided	Western Europe: Most important service	Nature of Work
11	6	15	10	A - New developm. of a fully integrated system
11	6	15	7	B - New development of a system component
2	0	5	0	C - Systems integration
1	0	4	0	D - Data communications networks
1	0	1	0	E - Data center operations
9	2	9	1	F - Maintenance and support

6	0	7	0	G - Testing
7	0	11	1	H - Design
1	1	2	0	I - Facilities management
1	0	1	0	J - Disaster recovery
1	0	2	0	K - Help desk
5	0	6	0	L - Localization
2	0	3	0	M - Training
0	0	0	0	N - Data Entry
N=15	N=15	N=19	N=19	

Firm and country advantage: Wages and human capital

Asked to elaborate on their country advantageous characteristics, almost all respondents (95%) emphasize talented professionals as an attribute of the country to potential clients (Table [4]). Analytically, this is not very revealing since all these firms are marketing their human capital –it is clearly their major asset.

Table 4. Country characteristics emphasized

"What country characteristics do you emphasize to customers?" (more than one answer allowed)	Number of responses (N=19)
Talented professionals	18
Low cost/ low wages	14
Rapid project start-up	9
Large pool of talented labor	7
Specific skills such as Microsoft, C++, etc.	4

Somewhat more objectively, 74% emphasize low wages as a country characteristic. This is instructive because it confirms a pattern of transition economies entering the global marketplace by competing on price rather than on innovation. To potential clients, it must be obvious that Central European companies are much less expensive than, say, their German neighbors. However, it will take some time to assure customers that these companies can actually do the job at adequate or high levels of quality. By showing that their country's educational system puts out talented professionals they can sell their own employees as high-caliber.

Related to this item is the companies' emphasis that there is a large pool of talented professionals. This is attractive to customers because it implies continued low wages, low company turnover, and growth opportunities (e.g., when the foreign customer needs more personnel for the job these can be readily found). About half the firms emphasized rapid project start-up. Rapid start-up is

critical to project-level decision-makers. Once a project is approved, the client company wants an immediate pool of labor to begin work, rather than waiting weeks or months for employees to finish other projects. Indian firms in particular have emphasized that their "excess" labor is ready to begin a project immediately.

Finally, a number of firms emphasize specific skills. Generally these are skills available in nations around the world. In a sense they are commodity skills. Therefore, these firms have no choice but to compete on price-based on low wages.

Country disadvantage: weak regulatory regime is perceived as a disadvantage

In Table [5], we summarize the results on comparative disadvantages when it comes to establishing an IT service sector capable of exporting to the U.S. With 68%, the most frequent response was that their countries' weak regulatory and legal regimes put the respondents at a disadvantage. In other words, respondents pointed their finger at the government. The second most common response was "poor reputation." The firms in Central Europe are well aware that the reputation hurdle is a big one.

The next two most common answers refer to core business issues: weak application knowledge and inadequate project managers. Weak application knowledge refers to the knowledge the programmer has about the actual application domain for which he/she is writing software, whether it be a gasoline distribution system, a utility for a database, or embedded software for a scientific measuring device. The second item deals with project managers. While it is important to have smart, capable programmers, they must work together on project teams. Well-trained, experienced project managers are the layer of middle management that gets the systems development projects done. This layer of technical managers typically takes years to develop.

Table 5 Competitive disadvantages of Central European countries

"What are your country's greatest comparative disadvantages when it comes to establishing an IT service sector capable of exporting to the U.S.?" (N=19)	
13	Weakness of government regulation and legal regime
8	Poor reputation
5	Weak application knowledge
5	Inadequate project managers
3	Poor English competency
2	Poor telecom infrastructure
2	Cultural distance

Poor English competency was selected by only 16% of respondents. This result is slightly baffling: Do the respondents not think that language differences play a role, or do they believe their employees speak English well enough to communicate with foreign customers and develop English user interfaces?

Businessmen, not political activists

We asked the respondents an open-ended question on policy: "What steps would you recommend your country undertake to improve its environment for outsourcing IT work from the U.S.?" Then we coded the answers and summarized them in Table [6]. Among those interviewees who answered the question, a third would like to see tax benefits for the IT sector. Slightly less than a third believe that IT education and, separately, reputation should be improved.

Table 6. How to improve countries' environments for outsourcing IT work

"What steps would you recommend your country undertake to improve its environment for outsourcing IT work from the U.S.?" (N=15)	
5	Create tax benefits for IT sector
4	Improvement of IT education
4	Improve reputation
3	Business associations should be more active
2	Speed up bureaucratic procedures/improve legal system
2	Convince U.S. (to open its markets or provide visas)
1	Provide information on business opportunities

Only 20% stated that business associations should be more active on their behalf. Possibly, this indicates that IT companies view themselves as businesses, not as political activists. Managers accept their country factors as constraints, as givens, rather than structures that can be changed through political involvement.

Interestingly, none of the respondents said that software piracy needed to be curbed, even though Central and Eastern Europe is notorious for its high piracy rates, and this surely prevents Western European and U.S. corporations to move some system development tasks to the region. Silence on software piracy may simply mean that companies are not aware of the issue.

Limited competition among Central European firms

In their search for contracts in the U.S. and Western Europe, Central European companies compete with firms from the U.S., the European Union, India, as well as Central and Eastern Europe (Table [7]). However, competition among Central European companies does not appear to be very strong. Three companies listed Bulgarian competitors for U.S. bids, and three listed the Czech Republic for West European bids. This picture is a promising one for Central European

industries: it means that the firms have not been "typed" as addressing a certain market segment. If these firms were "typed" they would be competing against other regional firms much more often.

Table 7 Competition for bids in U.S. and Western Europe

"During the last five bids in the U.S. and Western Europe, what were the country origins of competitors?"		
Country origin	U.S. (N=13)	Western Europe (N=17)
India	7	5
U.S.	5	4
EU member state	3	7
Poland	2	1
Bulgaria	3	1
Hungary	1	2
Romania	0	1
Czech Republic	2	3
Russia	2	5
Ukraine	0	1
Algeria	1	0

There are differences, however, in competition for U.S. and West European markets. For U.S. bids, India is most relevant as a competitor, with over fifty percent of respondents listing Indian competitors. 38% of respondents listed U.S. companies as competitors for U.S. bids. In bids for Western European contracts, the playing field appears to be more level. 41% of competitors came from a EU member state, and 29% come from India and Russia, respectively.

How do Central European firms compare to the successful Indian industry?

Our respondents attribute a substantial part of Indian success in bids for Western European and U.S. contracts to their good reputation. Asked if India's reputation for being good at outsourcing was partly responsible for respondents losing contracts to India, five out of 20 said yes, two answered negatively. While the response rate for this question was low - with only 35% offering an opinion - the finding is corroborated by answers to the follow-up question "What advantages do your Indian competitors have?" (Table [8]). 38% of respondents selected "Firms are better known" and 19% chose "Better overall reputation for IT work" as a response. One respondent added in his own words: "Stronger than the [Indian] reputation, we feel is the Indian networking, i.e. Indian [immigrants] in top-management of the US and EU organizations."

Table 8. Advantages of Indian competition

"What advantages do your Indian competitors have?" (N=16)	
7	Less expensive
6	Firms are better known
3	Better overall reputation for IT work
3	More professional sales marketing
2	More human resources
2	More sophisticated development process
2	Government support/protection

The most important factor from the respondents' viewpoint was price. 44% selected "less expensive." Although Central European wages are low compared to those in the U.S. and the European Union, Indian firms have been price competitive. But this data conflicts with the next item, in Table [9], in which some of the region's firms see themselves as being competitive on price. Also note the significant wage differentials between Poland on one hand and Romania on the other.

In an open-ended question, we asked the respondents for the competitive advantages of their firms vis-à-vis the Indian competition. Then we applied open coding to these responses. Some felt that cultural closeness was their edge. This is a refrain heard from other marketing people: From managers we heard, in reference to the advantage of accessing markets in Western Europe relative to the Indians, "we are Europeans, after all." The question is whether the perception of the companies matches reality.

Table 9. Competitive advantages of respondents

"When you compete with Indian firms in the US or Western Europe, what are the competitive advantages of your **company**?" (N=16)	
5	Cultural closeness
5	Quality/know-how
3	Closer time zone
3	Lower cost
2	Flexibility
2	Experience with foreign companies/similar projects

Market access through personal connections

The respondents were asked how they are able to win contracts for work abroad. They were given open-ended and closed-ended questions for this topic. First, we asked the respondents how many of their last contracts with U.S. firms went

through a competitive RFP ("Request for Proposals") process. 60% had never won a contract through this process, which indicates that it plays a very minor role for Central European IT companies. While not all projects are awarded based on an RFP, it might also be that Central Europeans do not have sufficient business connections in the U.S. to make it onto the RFP mailing lists.

We then asked the open-ended question how these firms won contracts and applied open coding. 82% professed to have won their contracts through personal contacts or direct references. This is a powerful finding, given that the question was open-ended and the respondents came up with the response without being prompted (Table [10]).

Table 10. How companies acquired their contracts (open-ended)

"How did you get the other contracts?" (N=12)	
9	Personal contact/reference
1	Trade fair/conference
1	Government tender
1	Chamber of Commerce etc.
1	Consultant/Business agent
1	Informal ties to immigrants
1	Website

Finally, we asked the respondents the closed-ended question of how they found their current customers in the USA and Western Europe. Here, word of mouth and reference play a smaller role than in the previous question. The most interesting result is that only one respondent selected the option "the Chamber of Commerce/Export Institute, or a similar third party mediated the business relationship" (Table [11]). This suggests that industry associations play a limited role in helping these small to medium-size firms close deals.

Table 11. How companies found current customers (closed-ended)

"How did you find your current customers in the USA and Western Europe?" (N=16)	
7	Trade fair or conference
6	Web site
6	Informal ties to immigrants to the U.S. or Western Europe
4	Consultant
1	Chamber of Commerce/Export Institute
3	Other: Word of mouth and references
2	Other: Direct mailing
1	Other: Visits to potential clients in the U.S., Europe
1	Other: Specialized magazines

Discussion and some preliminary conclusions

The task of integrating the economies of Central Europe with the emerging global information economy is important for the future prosperity of the region. This task by and large has received far less attention than the national goals of accession to NATO, EU, or the OECD. Indeed what is striking is that until quite recently the region lacked well developed strategies of how to achieve integration into the international information economy on the best terms possible. As the Human Development Report puts it, "the technology revolution begins at home – yet no country will reap the benefits of the network age by waiting for them to fall out of the sky" (UNDP 2001).

Under present conditions Central Europe – especially as compared with India (or even Russia) – is not considered by Western companies as an attractive destination for IT outsourcing. Before this may happen, the region as a whole as well as individual countries have to overcome negative perceptions of quality as well as build an international presence through a sustained promotional effort.

Our findings are also encouraging, however. We have evidence that in spite of a lack of international awareness and recognition even small Central European companies can successfully compete on cost and technical expertise to win significant (if not very large) international contracts. It is the opinion of the Central European IT exporters that they could do more with government policies designed to support them. They also acknowledge the need to improve their capabilities in project management, English competency and knowledge of Western business culture. This self-perception coincides with the expectations of Western firms and consultants, who stress that Central European IT firms need to change quickly to meet international standards for quality, speedy communications, dependability and adaptability.

The growth and improvement of the Central European export oriented IT sector brings up the question of size, critical mass and investment. Given the existing intense international rivalry, the Central European IT exporters will likely find it hard to grow without supporting government policies. In turn for the governments to pay attention, an effective lobbying effort has to be made by business associations. Below we make some recommendations that flow from our study and are addressed at governments, business associations and the companies themselves.

As has been pointed out, most Central European governments have policies that support and frequently subsidize traditional sectors of the economy such as agriculture, mining, and heavy industry. At the same time, they lack sufficient policies and programs that would be oriented towards the industries of the future, such as IT and high technology. The explanation of this paradox is simple: traditional sectors have powerful lobbies with strong political representation. Western companies, which also have considerable influence,

push for market opening measures and not for the support of a nascent local IT industry. The experience and success of countries such as India and to a lesser degree Russia offer important lessons for Central Europe in the sense that an internationally competitive IT sector can be created (American Chamber of Commerce in Russia 2001).

The creation of an effective national IT industry lobby is the task of private sector business associations, but given the weakness of the sector, the government may have to play the role of a catalyst. It needs to send a clear message to the private sector that it considers IT exports a high priority and is willing to provide support. Within the government, clear responsibility for technology policy must be established – without however creating a new bureaucracy. It should be a cabinet level position (education and science is one possibility) with a budget and a mandate to coordinate policy with other government agencies, such as the Ministry of Finance, the Ministry of the Economy, etc. At present, responsibility for the IT sector is often split up among a large variety of agencies.

The lesson of the Indian success means that Central European governments should provide more outlays on IT education, training and research including resources for foreign study and internships. A system of national merit scholarships for students of computer science attending the best technical colleges should be introduced.

Although there are business associations in each of the countries of the region, none of them has reached the size and effectiveness of NASSCOM – the Indian association that provides a clear model for others to emulate. To become effecttive, the IT sector associations need to build membership and develop resources. In some countries they may need to undertake fundamental restructuring to eliminate built-in conflicts of interest. Given the general weakness of business associations in Central Europe, the task of strengthening IT sector associations is a difficult one, especially since these are in a disadvantaged position from the outset. Some leadership may be needed from the national chambers of commerce. In addition, the government coordinator of technology policy may have to play a limited leadership role in this process. Training and support can also be provided by international donors. To be effective, the leadership of the associations should be capable of operating not only as a domestic lobby for the Industry but also as an international ambassador and promoter of the companies.

IT companies themselves should also undertake vigorous actions if they are to improve their position in the fiercely competitive international market for outsourcing services. They should:

- Work together to develop a strong business association that can effectively lobby the government on behalf of the software sector. The companies alone

cannot solve the promotion and image problems of the industry in the international market.

- Establish partnerships with universities and R&D institutions by funding scholarships for talented students and sponsoring research programs and in return obtaining information, contracts, training opportunities and talent. The partnerships should not be limited to technical universities alone but include, for example, private business schools of which many have been formed in recent years. The government can provide tax incentives for the formation of the partnerships.
- Invest in professional and management education. Many of the smaller firms were founded by IT entrepreneurs who often had strong technical backgrounds but lacked expertise in professional management, as well as language skills. These weaknesses must be systematically corrected through vigorous training and hiring policies within the companies themselves. Project management, English language, and international business education are among the most important areas of concentration.
- Seek out and form strategic partnerships and joint ventures with western firms. This may be the fastest way to obtain needed management expertise, technology and contracts and may be preferable to simply selling the company to a large investor from abroad. Indeed for some Central European IT firms, the best option may be to become a specialized subcontractor to larger western outsourcing companies.

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