Panel 1

Brain Drain: Some Evidence from European Expatriates in the United States*

Introduction

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Since 1995 Europe has been unable to close the economic gap with the United States. Growth has been faster in America as it reaped the benefits of full employment and new information technologies. Europe is worried about its aging population, its ability to adapt to technical change, the burden of its welfare state and the pains of labor market deregulation. Among the worries is the fear that it might be losing its most talented workers to the United States. Stories about successful expatriates in Silicon Valley or at top academic places abound. Many European politicians and businessmen additionally complain that Europe cannot compete against the United States in attracting talented people because of high taxes and complex regulations.[1]

This paper provides some evidence of the brain drain from Europe to the United States.[2] It uses US Census data for 1990 and 2000 to measure the characteristics of European expatriates and to examine how they fare in the US labor market.

The data confirm the presumption that the share of skilled labor of expatriates is much larger than that of the people in the source countries. The quantitative significance of this fact, however, is open to debate, as the total number of expatriates ranges only between 0.5 and 1 percent of the total population. If one takes the view that labor consists of homogeneous inputs, such as skilled labor and unskilled labor, then our back-of-the envelope computations suggests a moderate adverse effect of the brain drain on inequality and income in home countries, with say a 2 to 3 percent increase in the relative wage of the skilled and a 0.5 to 0.7 percent decline in GDP per capita. On the other hand, if one assumes that labor is not a collection of homogeneous inputs, and, that very talented individuals are crucial for innovation, business formation, and management[3], the loss could be considerably larger. Yet its size is much more difficult to estimate in this case. (An interesting first step was made by Zucker et al. (2003)). My speculative extrapolations suggest that the proportion of European immigrants in the United States who do "matter", could be as high as 50 percent; that is huge and can in principle have dramatic consequences on Europe's growth potential. While such a number can be disputed, casual observation suggests that in my field (research in economics), it is about right.

Data

The data I use are US Census data for the years 1990 and 2000. I look at the demographic and economic characteristics of Europeans living in the United States in both samples. Using both years can in principle tell us about interesting aspects of the dynamics of the brain drain.

The only difficulty in using census data to learn about expatriates is their definition. Citizenship is clearly not a very good indicator, as many expatriates have US citizenship. We prefer to use the country of birth as our defining variable. But this is not immune to criticism, since it also includes people born to American parents abroad, children of US soldiers, etc. However, we assume that this is a rather small group which would not bias the research

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[1] See, for example, François-Poncet (1999) and Mahroum (1999).
[2] See Becker et al. (2003) for an analysis of the brain drain from Italy to the rest of Europe.
[3] Stephan and Levin (1999) document the exceptional contributions to US science made by foreign-born researchers.

results in any significant direction. We limit the analysis to five continental countries (Belgium, France, Spain, Italy and Germany) in addition to the United Kingdom, which we expect to follow a different logic given its historical ties and language community with the United States.

Basic demographics

Table 1 reports not only the number of citizens born in each of the six selected European countries in the age group between 25 and 64 (thereafter referred to as "working age") recorded in the two US Censuses, but also the share of the working-age population in the country of origin. These fractions vary between 0.36 percent in Spain to 1.66 percent in the United Kingdom. This fact suggests that the macreconomic effects of the brain drain are unlikely to be large but they are not insignificant either.

If the distribution of workers' characteristics is the same among emigrants as in the home country labor force, emigration just reduces the size of the home country labor force homothetically, with no effects on wages in the long run and a positive effect in the short run, as there remains more capital per capita in the source country. However, if some groups are disproportionately represented among expatriates, emigration may have non-negligible effects on the structure of wages. Suppose, for example, that we have two types of workers, skilled *(H)* and unskilled *(L)*, and that initially the skilled account for 10 percent of employment but get 30 percent of total income. With a Cobb-Douglas production function this would imply[4] $Y = AH^{\alpha} L^{1-\alpha}$, with $\alpha = 0.3$ and $H/L = 1/9$. Now, if 1 percent of the population goes abroad and 30 percent of them are skilled, the H/L ratio falls by some 2.2 percent. That means that the wage gap between the skilled and the unskilled in the home country will go up by 2.2 percent too, with 0.66 percent wage reduction for the unskilled and a 1.54 percent wage gain for the skilled. One also finds a 0.4 percent drop in GDP per capita. That is not huge, but not negligible either. If the exodus is highly concentrated among the skilled, say if all those who leave are skilled, the H/L will fall by 10 percent, and so will the relative wage of the unskilled, whose absolute wage falls by 3 percent, while that of the skilled increases by 7 percent. That is about the upper bound of how the wage distribution can widen if a country loses 1 percent of its workforce. As for GDP per capita, it would mean then a fall by 2.1 percent.

A comparison between the two census years also reveals that the brain drain accelerated, but not dramatically so: in all countries except Italy, a slightly lager share of the home working age population was employed in the United States in 2000 than in 1990. In the case of Italy, a traditional source of low-skilled immigrants, the fraction actually fell, reflecting the phasing out of low-skilled migration from Italy to the United States. These numbers suggest that there was no strong acceleration in the latter part of the 1990s, and that the phenomenon is of the same order of magnitude as in the 1980s.

In Table 2 we present more information by looking at the age distribution of Europeans living in the United States. We observe that for France, the United Kingdom, Italy and Germany, there were actually fewer workers aged 25-34 living in the United States in 2000 than in 1990. In at least two of these cases (France and Germany), this seems to be due to a burst of emigration from this group in the 1980s, as it represents an abnormally high share of the expatriate population. Nevertheless, this fall in the number of expatriates in this age group is somewhat paradoxical in light of the overall increase in the number of expatriates. Conventional wisdom would suggest that (i) people go to the United States when they are young, (ii) there was more emigration from Europe to the United States in the 1990s than in the 1980s, and (iii) there is substantial net return migration as people get older. In fact, while entry of young workers seems to have fallen in the 1990s compared to the 1980s (except for Belgium and Spain),

Table 1

European-born population aged 25-64 in the US

Country	1990		2000	
	Number	% of home pop.	Number	% of home pop.
Belgium	21,561	0.45	22,631	0.62
France	115,245	0.40	133,873	0.43
UK	450,804	1.53	524,922	1.66
Spain	57,375	0.29	78,061	0.36
Italy	344,406	1.15	303,685	0.93
Germany	657,937	1.40	720,555	1.54

Source: US Census 1990 and 2000.

[4] That is the long-run production function, where capital is left to adjust and thus ignored.

Table 2

Age distribution of expatriates in 1990 and 2000
(in thousands, percentage of the US Census expatriate population in parentheses)

Country	Year	Age group			
		25-34	35-44	45-54	55-64
Belgium	1990	4.7 (22.1)	6.3 (29.0)	4.6 (21.4)	5.9 (27.4)
	2000	6.1 (27.1)	5.2 (22.8)	6.8 (30.1)	4.5 (19.9)
France	1990	47.7 (41.4)	25.7 (22.3)	19.6 (17)	22.3 (19.4)
	2000	32.4 (24.2)	54.3 (40.7)	27.4 (20.5)	19.8 (14.8)
UK	1990	125.8 (27.9)	122.8 (27.2)	111.9 (24.8)	90.3 (20.0)
	2000	117.9 (22.5)	163.4 (31.1)	130.1 (24.8)	113.6 (21.6)
Spain	1990	20.7 (36.1)	12.4 (21.7)	12.7 (22.1)	11.6 (20.1)
	2000	27.6 (35.4)	25.0 (32)	13.7 (17.6)	11.8 (15.1)
Italy	1990	59.8 (17.4)	90.0 (26.1)	94.0 (27.3)	100.7 (29.2)
	2000	39.4 (13.0)	71.4 (23.5)	96.8 (31.9)	96.0 (31.6)
Germany	1990	214.7 (32.6)	172.8 (26.3)	141.0 (21.4)	129.5 (19.7)
	2000	176.9 (24.6)	236.0 (32.8)	170.3 (23.6)	137.3 (19.1)

Source: US Census 1990 and 2000.

there was substantial entry of older workers in the 1980s, so that there is no evidence of net return migration. There was enough of an inflow of migrants in the older cohorts so as to offset the fall of migrants in the younger ones. This fact becomes clear in Table 3, which performs a cohort analysis, comparing the size of an age group of European migrants living in the United States in 2000 with the size of that same cohort in 1990. The cohorts aged between 25 and 44 living in the United States in 1990 (who were between 35 and 54 in 2000 and are captured in the first two columns of Table 3) increased in size in the 1990s, and even the 45-54 cohorts barely decreased. Of course, that may hide a large number of two-way movements between Europe and the United States. Yet, for a policymaker who worries about the brain drain, this fact suggests that return migration is on balance not to be counted on: those who return are quite likely to go back and definitive return is deferred to retirement time.

One can only speculate about why the younger age group has declined in size at the same time as older groups have increased. The effect is too large to be explained by a reduction of the size of the corresponding cohort in the source country due to aging. A deterioration of foreign language skills learned at school does not square with the fact that the effect is also observed in the United Kingdom.

The next two tables compare the employment rates of expatriates with those of other US residents in the investigated years 1990 and 2000. We find that for men, employment rates for European expatriates were higher than average in the US labor market, and therefore substantially higher than in their home countries. For women, the employment rate was higher than in their home countries but lower than in the US labor market.

These results are not surprising at all: one does not emigrate to a country like the United States, if one does not see any favourable employment prospects there. But, to the extent that it signals a greater chance of employment of expatriates relative to stayers, that effect should also be added when computing the adverse effects of the brain drain on GDP per capita.

Table 3

Inflows by cohorts (in %)

Country	Cohort in 2000		
	35-44	45-54	55-64
Belgium	+ 10.6	+ 7.9	– 2.2
France	+ 13.8	+ 6.6	+ 1.0
UK	+ 30.0	+ 7.0	+ 1.5
Spain	+ 20.8	+ 10.5	– 7.1
Italy	+ 19.4	+ 7.6	+ 2.1
Germany	+ 10.4	– 0.9	– 2.6

Source: US Census 1990 and 2000.

Education

We now turn to the observable dimensions of worker quality, in particular education. We are especially interested in highly skilled people, and therefore will focus on the most advanced degrees. Table 6 lists the share of the expatriate population with

Table 4

Employment rate (in %), men

Country	1990		2000	
	US residents	Home country	US residents	Home country
Belgium	87.4	77.1	87.5	78.1
France	88.3	80.5	85.1	78.5
UK	89.7	84.2	87.5	82.2
Spain	85.4	79.5	80.8	80.2
Italy	83.6	81.4	76.7	75.9
Germany	88.4	80.1	85.5	77.4
US		85.3		85.2

Source: US Census 1990 and 2000.

Table 5

Employment rate (in %), women

Country	1990		2000	
	US residents	Home country	US residents	Home country
Belgium	55.0	44.3	61.7	57.5
France	61.8	57.4	65.9	62.5
UK	64.3	62.0	64.8	66.9
Spain	60.9	32.7	61.4	45.1
Italy	53.3	39.7	56.6	43.2
Germany	64.0	51.7	65.8	60.7
US		66.1		70.2

Source: US Census 1990 and 2000.

Table 6

Share of expatriate population with tertiary education vs. corresponding share in home country and entire US Census (in %)

Country	1990		2000	
	US census	Home country	US census	Home country
Belgium	47.6	17	59.6	26
France	42.7	14	56.1	21
UK	38.9	15	49.2	25
Spain	30.6	9	44.1	21
Italy	17.1	6	25.7	13
Germany	34.6	17	41.9	28
US	29.7		33.8	

Source: US Census 1990 and 2000.

Table 7

Proportion of expatriates with a Ph.D. degree and comparison with the US labor market (in %)

Country of origin	1990	2000
Belgium	4.33	5.78
France	3.1	4.9
UK	3.2	3.9
Spain	2.7	4.6
Italy	0.96	2.0
Germany	1.72	2.39
US	0.82	0.98

Source: US Census 1990 and 2000.

tertiary education, classified by its European origin. For most European countries, it is far larger than the corresponding US share (i.e. 29.7 and 33.8 percent for 1990 and 2000, respectively) and even larger than that of the corresponding home country. For example, in 2000, 56 percent of French-born workers living in the United States had a college degree, compared to a share of 21 percent in France. Most remarkably, the education level of the expatriates seems to have improved during the 1990s at an even faster pace than in the source countries. While the fraction of the source population with a college degree increased by 9, 7, 10, 12, 7 and 11 percentage points in Belgium, France, the UK, Spain, Italy, and Germany, respectively, among expatriates it went up by 12, 14, 11, 14, 8, and 7 percentage points. Thus only in Germany does the share of the home population increase faster than for expatriates.

These data confirm that the expatriates are heavily selected among the most educated workers. This skewness increases when one moves up the skill ladder. Table 7 reports the share of expatriates who have a Ph.D. degree and compares it to the average US worker with the same qualification. Unfortunately, we do not have the corresponding figures for the European countries, but they are unlikely to be higher than the US figure.

The share of expatriates who have a Ph.D. degree has grown more rapidly among expatriates than among Americans. In 2000, it is two to six times higher than the US share. The phenomenon is even more salient if one only looks at those who arrived in the United States less than 10 years before the census. The proportion of Ph.D.s among them can be as high as 10 percent (Table 8).

Table 8
Share of labor force with Ph.D. degree among newly arrived workers (in %)

Country	1990	2000
Belgium	8.06	10.53
France	8.2	8.6
UK	5.4	5.3
Spain	4.0	9.4
Italy	2.9	8.6
Germany	4.9	6.8
US	0.82	0.98

Source: US Census 1990 and 2000.

Assuming that the average proportion of expatriates having a Ph.D. degree will converge to a level of 10 percent which is an upper bound, that the proportion of Ph.D.s in the origin country's population amounts to 0.5 percent (about half the US level), and that a share of 0.5 to1 percent of a typical European country's citizens live in the United States, we see that the share of a country's Ph.D.s working in the United States could go as far as 10 to 20 percent. Furthermore, there are presumptions that these are more talented than the home country Ph.D.s, something which cannot be ascertained, however, based on these data. Finally, from the point of view of measuring the economic consequences of the brain drain, we also want to know the contributions of Ph.D.s to GDP, both in Europe and in the United States.

On the basis of Table 6, we suppose that, for any segment of the distribution of income, the fraction of expatriates is twice higher in the first quartile of the ability distribution than in the population as a whole, and we apply this condition to Ph.D.s. Then, in our stylized example, this would imply that as many as 20 to 40 percent of a quarter of the best Ph.D.s could live in the United States, depending on the total expatriation rate. Suppose now that we follow Zucker et al. (2003) and assume that those who really matter (i.e. they exert significant externalities of innovation and firm creation) are the "star" people, which are the top 5 percent of Ph.D.s (see also the sample of biotechnologists in Zucker et al. (2003)); that would more or less correspond to the top quartile of the top quartile. Under our extrapolation, this would, in turn, mean that 40 to 80 percent of the European stars would be living in the United States. If, for example, the level of innovation is proportional to the number of such stars, a potential implication is that the number of new products and processes being invented in Europe would be about twice as high than absent the brain drain.

Wages

Education, as measured by the number of years, is of course not the only relevant characteristic that people bring to the labor market. There are other dimensions of skills that are not observable by the statisticians (one of them being the quality of education). How are Europeans selected according to those dimensions? One way to answer that question is to estimate a standard wage equation and enter dummies to find out if, given their observable characteristics, Europeans earn more than their counterparts in the US labor market.

Table 9 reports the results of such a regression for both census years. The "European premium" is uniformly positive and significant, ranging from 2 to 16 percent. It is quite small for the German-born immigrants. During the 1990s, it has risen sharply for the immigrants of French, British, and moderately of Spanish origin. It has fallen for Italian, Belgian and German immigrants. These trends may be due to changes in the distribution of expatriates' unobservable characteristics or to changes in the demand for specific goods they produce. It may also be that average unobserved worker quality follows a different trend in the home countries as compared to the United States, but one does not see why this should be so (trends in international comparisons of student achievements do not exhibit such patterns). My favored explanation is that positive selection of migrants in the dimension of unobservable worker quality has intensified during the 1990s, which may be shown by the general increase in the returns to skills documented in the United States. The increase was much less salient in Europe.

A relevant question is: how does the wage premium vary across educational levels? Answering this question would provide valuable information about the nature of emigration. If the wage premium is higher for less educated workers, which would suggest that

Table 9
Wage premia for European expatriates (in %)

Country	1990	2000
France	4.9 (19.4)	10.7 (44.8)
Italy	16.7 (113.0)	11.5 (69.0)
Germany	3.12 (29.5)	2.14 (20.6)
UK	12.6 (99.1)	16.3 (135.7)
Spain	6.2 (17.15)	7.9 (24.3)
Belgium	15.1 (24.1)	13.8 (23.5)
(t-statistics in parentheses).		

Source: US Census 1990 and 2000.

Table 10

Estimated wage premia for expatriates with and without tertiary education

Country	1990		2000	
	Non-tertiary	Tertiary	Non-tertiary	Tertiary
France	9.8	14.6	12.4	23.3
Italy	9.1	7.25	9.0	9.0
Germany	8.7	5.0	6.15	7.8
UK	20.9	24.7	23.6	27.9
Spain	8.8	3.7	11.2	13.9
Belgium	24.2	19.2	16.9	26.2

Source: US Census 1990 and 2000.

institutions in their home countries are not very good at remunerating their skills, either because the educational system fails to certify them adequately (for example, a good mathematician does not find the appropriate curriculum), or because the labor market works poorly at rewarding skills other than education (for example if there are binding collective wage agreements that do not give "points" for such skills). On the other hand, if we find that the wage premium is higher for more educated workers, this would suggest that among the most educated, the better qualified have an even greater probability to move to the United States, confirming that selection operates more strongly when one moves up the skill ladder. Such a finding would be roughly consistent with the model of migration developed by Borjas (1987).

For this reason I ran wage regressions in which the workforce is split into the two educational categories ("tertiary" vs. "non-tertiary"), and use an interaction term between the tertiary education dummy and the place of birth dummies. The results are illustrated in Table 10. Note that the estimated premia are higher when the specification corresponding to the preceding table is used. In 1990, the wage premium was higher for college graduates than for other workers for French-born and British-born immigrants, and smaller for others. In 2000, it was higher for all countries of origin. Hence, in 2000, selection of the best workers was more intense among college-graduates than among others.

Entrepreneurs

In light of the view that the brain drain is a matter of concern because a number of expatriates are exceptional individuals, we may ask wether entrepreneurs are over-represented among expatriates. Table 11 reports the share of workers who have an entrepreneurial activity, and compares it to the corresponding US share.

The proportion of entrepreneurs among expatriates was slightly higher than among Americans and remained stable between 1990 and 2000. How does it compare to the corresponding share in the home country? While such a comparison should be taken with caution, the *Global Entrepreneurship Monitor* (2002) suggests that it is about lower by half in Europe than in the United States. If one takes this proportion seriously, then European expatriates are likely to be entrepreneurs a bit more than twice often than those who remain in Europe. This fact does not obviously imply that they are very skilled, as among them are shopkeepers, taxi drivers, etc, and gives us no information on the relative quality of European entrepreneurs based in the United States vs. those based in Europe. And there are problems of comparing entrepreneurship data across countries. Nevertheless, these numbers suggest that a disproportionate fraction of entrepreneurs are likely to emigrate to the United States.

Conclusion

This study has provided a number of stylized facts about European-born immigrants in the US labor market. We have found that their skill level is substantially higher than in Europe, and that they compare favorably to Americans of similar educational levels in terms of unobservable quality, since there is a positive wage premium for European-born participants in the US labor market. European expatriates also have a high employment rate and represent a high proportion of entrepreneurs. They are several times more likely to have a Ph.D. than the average

Table 11

Proportion of entrepreneurs (in %)

Country	1990	2000
Belgium	13.18	11.51
France	10.67	11.39
UK	9.84	10.55
Spain	10.96	10.29
Italy	13.42	14.21
Germany	9.85	9.39
US	8.08	9.08

Source: US Census 1990 and 2000.

US labor market participant, and presumably also than the average European resident. The proportion of Ph.D.s among recent expatriates can be as high as 10 percent.

This highly biased composition of European expatriates has to be balanced against their relative small numbers – about 0.5 to 1 percent of the home population. If one takes a rather homogeneous view of the labor market, this fact suggests that the economic consequences of the brain drain on the home country cannot be dramatic – it implies a moderate increase in inequality and perhaps a 0.5 percent reduction in GDP per capita. These numbers could be considerably higher if one considers that a country's potential for growth and innovation is chiefly determined by key individuals – scientists, managers and entrepreneurs – and that a large proportion of the most talented have moved to the United States.

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Panel

The panel was chaired by **Daniel Schwammenthal,** Amsterdam-based editorialist for the Wall Street Journal. Panellists included personalities from politics and business.

The Lithuanian Minister of Finance, **Rimantas Šadžius,** focussed on his country's strategy for retaining its talent. Since the fall of the Iron Curtain, Lithuania has lost nearly 10 percent of its population. The peak emigration numbers of 2004 and 2005 are declining, however, and with the rise in per capita income, immigration is increasing, though net migration is still in negative territory. What can be done to attract the emigrants back? Certainly improved working conditions and social protection, but efficient funding structures for scientific research are also necessary, especially increasing the private-sector share of R&D. To do this, in addition to the low corporate income tax of 15 percent in Lithuania, private enterprises can deduct their scientific research and experimental development costs three times from taxable income.

For **Jürgen Dormann,** Chairman of the Board of Directors of Adecco SA, the term "brain drain" is too intellectual or academic; the focus should be on all highly skilled workers. His firm spends large sums of money on "life-long learning", on the further education of its staff. Also important is achieving a gender balance, especially raising the qualification level of female staff.

The President of the Technical University of Munich, **Wolfgang A. Hermann,** was optimistic about Europe's chances in competition for global talent, especially because of the great advantages offered by EU integration and Europe's cultural diversity. To attract the best minds globally and induce the best talent to return, he discussed three options: (1) universities need a broader funding basis and better fund-raising, especially from alumni, (2) through better networking, universities must become attractive partners to industry and other universities, and (3) the cultural environment should not be underestimated as a factor in attracting talent. This complex factor is just as important as the abstract, "brain-drain" figures. To underscore his optimism, he pointed out that there are signs that the "times are changing; people are coming back".

In the interim discussion, **Brenda King** of the EU Economic and Social Committee, pointed to Europe's unemployment problem, which is partly caused by young people leaving educational institutions without the right skills. **Reiner Klingholz,** Director of the Berlin Institute for World Population and Global Development, spoke of the brain losses in Eastern Europe countries, which then turn to their neighbours further to the east to compensate their losses. If they at some point succeed in getting their emigrants to return to ensure an adequately large labour force, the west will stand to lose the potential that it gained. For **Martin Hüfner** of HF Economics,

the "brain drain" discussion unfortunately has nationalistic overtones; going abroad is a great opportunity for young people and should be encouraged. **Georges Lemaître** of the OECD emphasised that we need to look at the net figures instead of just gains and losses. Germany, for example, has a net gain of about 4 percent with respect to its stock of university graduates.

The next presentation was by **Peter M. Heij,** Head of Satyam Computer Services, an India-headquartered, global IT services company. He explained how companies like Satyam can enhance the sectors they represent and can be a solution to the brain drain problem by providing skilled resources at attractive cost levels, thus helping the economies where they serve.

Roland Berger, Founder of Roland Berger Strategy Consultants, added the concept of "brain train", by which he meant a "brain circulation", as practiced by his company, which offers an international working environment. Mentoring and on-the-job training comprises some 10 to 15 percent of their employees' time. To succeed in the competition for global talent, the quality of life is important, consisting of career opportunities, good schools, a safe environment, rich cultural offerings, a good life/work balance and recreational opportunities. Here Europe is well positioned. Education needs to be based on meritocracy where performance in rewarded; state monopolies in education, as in Germany, with frequent government interference is a competitive disadvantage. Finally, social discrimination in education is detrimental and means that potential talent is wasted.

In the discussion that followed, the question was raised as to how to increase the private sector share of R&D in Europe. Improving the environment for creating new businesses especially via better tax structures would help, according to **Roland Berger. Tito Boeri,** Bocconi University, brought up the issue of the market for managers and why the share of foreign managers is so low in Europe, especially in Italy. This is changing in Germany, according to Roland Berger, especially on the supervisory boards. **Jerzy Duszynski,** Undersecretary of State in the Ministry of Science and Higher Education in Poland, reported on the Polish situation. Brain circulation is absolutely vital for his country. Without it, the country would be moving very slowly. Recently, quick changes have occurred in the migration figures. Because of the weak dollar many are returning to Poland, also from Ireland and France. "Our responsibility is to create opportunities for our talented people in Poland."

Bosco Novak, Head of Human Resources at Nokia Siemens Networks (NSN), gave the last panel presentation, addressing the problem of retaining talent. If people are highly engaged in a company, a region or a country, retention is also high. The main drivers of engagement are: (1) innovation – with support for an entrepreneurial spirit and rewards for success, (2) personal growth – people must have the opportunity to learn, to develop competence and to advance, and (3) leadership – good leaders supply a secure base, allowing their people to explore and experiment. Novak questioned whether "brain drain" is an appropriate concept in today's networked world. India, for example, is no longer seen as a country that has suffered from brain drain. The internet has brought us all closer together so that the question of "where the brain is" is less important.

In the discussion, **Patrick M. Liedtke,** Head of the Geneva Association and Chairman of the Silver Workers Institute, pointed out that we are not giving attention to retaining the talent of the fastest growing group, the 60+. The Chinese have discovered this potential and are scouring the world for proven talent, often retired people, and "we haven't yet adjusted to this paradigm change". For **Samuel Brittan,** columnist of The Financial Times, the European brain drain is a "non-problem". The problem is the "European Social Market" and the inadequate remuneration that this induces. In the private sector there is more freedom to settle remuneration; European universities cannot attract "star talent" because they cannot pay "star money".

Hans-Werner Sinn questioned the OECD's percentage target of academically trained people in a country. This seems to underplay the strengths of Germany's dual vocational education system. **Wolfgang Herrmann** criticised the early selection of the German educational system but also pointed out that not everyone has the intellectual capabilities for tertiary education; for the rest Germany's vocational system has worked well, contributing to the quality and precision of German production. **Gilles Saint-Paul** observed that skilled people are more or less interchangeable. Top people, however, are not interchangeable and they play a crucial role in the growth process since they are the ones who introduce new ideas. **Ann Mettler,** Head of the Lisbon Council for

Economic Competitiveness in Brussels, criticised that immigration is handled by justice ministries, which tend to keep people out. "Skill and human capital are economic issues and should be dealt with by finance ministries" or better still by new ministries devoted to innovation, entrepreneurship and human skills. At the EU level ECOFIN (Economic and Financial Affairs Council) could take on these responsibilities.

Daniel Schwammenthal summed up the discussion by stressing that Europe needs to attract new talent from abroad and fully use our often dormant domestic talent. Regulations in Europe must be changed to make it easier for innovators to start companies, and a new way of thinking is needed in light of the millions of new competitors in the market.