
Soaring Minds: The Flight of Israel's Economists*

CEPR Discussion Paper No. 6338 (updated)

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Abstract

This paper focuses on one of modern day's greatest – in terms of magnitude and in terms of quality – brain drains between developed countries. While Europeans are becoming increasingly concerned about the out-migration of the continent's top academics, Israel's rate of academic emigration is already four times the emigration rate of the leading European country.

In the area of economics, the exodus of younger academics coupled with a heightened retirement rate among the older academics has brought Israel's top economics departments – among the best in the world, until now – to the brink. The elimination of the country from the international research envelope in the future has become a realistic possibility that will impact not only the State of Israel, which stands to lose the most, but the profession in general. A snapshot of an implosion in progress is provided here. This is a case study that is important for other countries to understand as some steadily advance toward the Israeli scenario.

* I would like to thank Nadav Shamir and Mariana Sadeh for providing data on various aspects of the academic salaries in Israel and explaining the non-obvious intricacies thereof. Many thanks also to Neil Gandal, Mark Gradstein, Robert E. Lucas Jr., Gilles Saint-Paul and Yishay Yafeh for insightful comments and suggestions.

1. Introduction

It couldn't have been a more fortunate fusion of events. A newly emerging world-class economist by the name of Don Patinkin decided to emigrate from the University of Chicago to the newly emerging State of Israel. His students were among the young country's best and brightest. That blending of state-of-the-art knowledge with innate ability spawned a generation of Israeli academic economists that have left their mark on the profession. A country that was not even on the map – literally – six decades ago, managed to bring itself to the forefront of the world's knowledge envelope within a couple of decades.

By the 1970s, it was among the most productive countries in the European area. A comparison of 600 universities and research centers in 18 European countries including Israel by Combes and Linnemer (2002) for the years 1971-2000 provides an indication of this impact. With only 7% of the researchers as the number one country, the United Kingdom, the total number of published pages by Israel's economists was 18% of the U.K. total. Compared to the number two country, France, Israel had 10% of the economists and published 40% as much as the French.

A comparison of publications in eight blue-ribbon journals hints of the quality of the research in Israel during these three decades.¹ The country's economists published 49% as many pages as those published by U.K. economists and 85% as much as the French in the top research journals.

Table 1 compares the 18 countries, putting the numbers into per author terms. Using the United Kingdom as a base, it is possible to see that the drop-off from the U.K., in terms of published pages per faculty member, is fairly steep in the other countries. Israel is the exception. Between 1971 and 2000, Israeli researchers published two and a half times as many pages per researcher as the U.K. economists. When the comparison is made in the top journals only, the ratio of published pages is nearly seven to one.

It would appear to be safe to conclude that, until recently, the contributions of Israeli economists, which were not proportional to the country's size, played a non-negligible role in

¹ The blue ribbon journals referred to by Combes and Linnemer (2002) are *AER*, *Econometrica*, *JPE*, *QJE*, *JET*, *REStud*, *REStat*, *IER*.

Table 1

**Ranking of European Countries
in Academic Economics, 1971-2000**

average number of quality-weighted published pages per faculty member
(UK = 100)

	All Economics Journals		8 Blue Ribbon Journals Only	
1	Israel	251.5	Israel	691.7
2	United Kingdom	100.0	United Kingdom	100.0
3	Belgium	71.1	France	78.0
4	France	60.4	Ireland	72.5
5	Norway	59.7	Belgium	55.0
6	Netherlands	51.7	Switzerland	48.6
7	Ireland	51.5	Sweden	42.2
8	Germany	47.0	Germany	38.5
9	Switzerland	45.3	Turkey	38.5
10	Greece	43.7	Austria	33.0
11	Austria	37.9	Netherlands	31.2
12	Sweden	33.6	Italy	23.9
13	Italy	32.8	Norway	21.1
14	Denmark	31.7	Spain	21.1
15	Turkey	20.5	Denmark	20.2
16	Spain	20.0	Finland	19.3
17	Finland	15.8	Greece	9.2
18	Portugal	10.6	Portugal	1.8

source: Dan Ben-David, "Soaring Minds: The Flight of Israel's Economists" (2007)
data from Combes and Linnemer (2002)

pushing forward the envelope of knowledge in the field of economics. By the end of the nineties however, the first signs of problems began to appear on the horizon.

In addition to their comparison of the decades between 1971 and 2000, Combes and Linnemer (2002) also compare the European countries during the sub-period of 1996-2000. Israeli economists were still ranked number one during this period in terms of per researcher output, but the gap between them and the other European countries declined considerably. For example, they produced "just" 55% more published pages overall than the U.K. economists and "only" four times as many pages in the top journals. While this reduction in the gap is probably due no doubt to improvements in the output of the U.K. economists (as well as those in the other European countries with whom the publication gaps declined), this drop in the publication gap also contains the seeds of a process that has only accelerated in Israel since 2000.

While a sizeable number of Israelis had always remained in the States upon completion of graduate school, there is today an overwhelming reluctance among current top graduates to return home. This reluctance, coupled with heightened emigration by some of the country's current leading scholars, has created significant cracks in the once-solid foundation built by Patinkin and his students. In recent years, the precipitous drop in quality and quantity is threatening to become a freefall.²

This paper provides a snapshot of a brain drain unparalleled in magnitude, when compared to the size of the home country. The economics implosion in Israel is part of a larger wave of top-tier academic emigration from the country. Signs of what is currently occurring in Israel have already begun to appear in other developed countries as well, though on a completely different scale – still – making the country an important case study that other countries should study, understand and prepare against a similar eventuality.

The next section provides some background evidence of the outward migration. The subsequent sections focus on the flight of the economists and examine some of the underlying reasons for the brain drain. The final section concludes.

2. Exodus

The issue of foreign academics in American institutions of higher learning may not be of much concern to the average American – except possibly in the event of individuals with a less-than fluent grasp of the English language who happen to teach American students in institutions costing tens of thousands of dollars a year. But, in an age where countries compete for the technological edge, the foreign academic inflow into the United States has much broader implications – and not only for America.

² National and personal security concerns no doubt play a role in the decision by some Israelis to leave and to remain abroad. This was the case in the past and this has been the case in recent years. However, it is difficult to see how this issue might explain the increase in the flight of academics from the country in recent years. The threat to the country's physical existence was much greater in the sixties and seventies, with all-out wars being waged on multiple fronts in each of these decades. Hence, for those whom security worries are the overriding factor in deciding to live abroad, a greater proportion of people should have decided to stay abroad in the past than during the recent decade.

The “brain drain” economics literature tends to focus more on issues of migration from developing countries to developed countries.³ But the subject of this paper, the flight of top academics from Israel to the States, does not appear to be primarily a case in which the importing universities in the States are searching for cheaper foreign skilled workers – at least, not yet. Questions of remittances back to the country of emigration, or of society bearing the costs of increasing the human capital of the star economists while not reaping the benefits from them, also do not appear to be at the heart of the issue (in the latter case, for example, most of the star Israeli economists were trained in the States on scholarships provided by American grants, though their primary, secondary and undergraduate schooling was certainly funded in large part by Israeli taxpayers). On the other hand, one seemingly relevant facet of the brain drain phenomena is talent poaching by American universities as a means for widening the American talent pool.

Saint-Paul's (2004) focus on European migration of skilled workers to the States reflects the strand of brain drain literature, from developed to developed countries, that is more applicable to the Israel-U.S. flow of academics. His examination of the skill levels of European expatriates in the States during the nineties reveals that the “skill composition of expatriates is much better than in the source countries. The quantitative significance of that, however, is open to debate, as the total number of expatriates ranges between 0.5% and 1% of the population.”

That said, Saint-Paul goes on to write that he believes that the proportion of Europeans in the States who “matter” may be as high as 50%, with non-inconsequential growth effects that may result. He adds that while some may dispute this conjecture, casual observation suggests that it is correct for the field of economics.

In its examination of the brain drain to the U.S., the European Commission (2003) reports that 73% of the 15,000 Europeans who studied for their Ph.D in the States between 1991 and 2000 plan to remain in America. If Europeans are concerned about the migration of their academics to the States, then Israelis should be nothing less than alarmed.

³ Commander, Kangasniemi and Winters (2004) provide a good contemporary summary of this literature.

In 2003, the combined senior academic staff (lecturer and above) in American schools of higher education numbered 1.18 million people (U.S. National Center for Education Statistics, 2005). Of these, 82,905 were foreign scholars working in American academia (OECD, 2006), i.e. 7.1% of the faculty in American universities. The foreign scholars came from all over the globe.

Though it does not supply the largest number of foreign academics to the United States, Israel nonetheless stands out. The 1,409 Israeli academics residing in the States in 2003-2004 equaled 45% of the 3,117 scholars that came from the U.K., 50% of the 2,842 French scholars, 59% of the 2,403 Russian academics, 61% the 2,317 Italians, and nearly three-quarters of the 1,893 Spanish academics (OECD, 2006).

But Israel is not a country of 60 million people, like the U.K., France and Italy – not to mention the 144 million Russians. In fact, the Israeli scholars in America came from a country with a population of only 6.2 million people in 2004.

Figure 1 shows the number of foreign academic scholars in the U.S. for each 100,000 residents in the home country that they left behind. In a sense, it is possible to divide the countries into four groups. The first group, containing second and third world countries, does not eclipse 2.4 scholars per 100,000 people. This may be due to the size and to the quality of these countries' academic institutions, who might be few in numbers and/or low in quality. Hence there may be a small pool to draw from in general, and/or few academics with the qualifications to work in American universities.

The first world comprises the second group, with 4-6 scholars per 100,000 population. This might be considered the baseline group since it includes countries that have utilized the world's leading-edge technologies to have become the most developed countries. Hence, they have both quantity and quality when it comes to individuals at the frontiers of human knowledge.

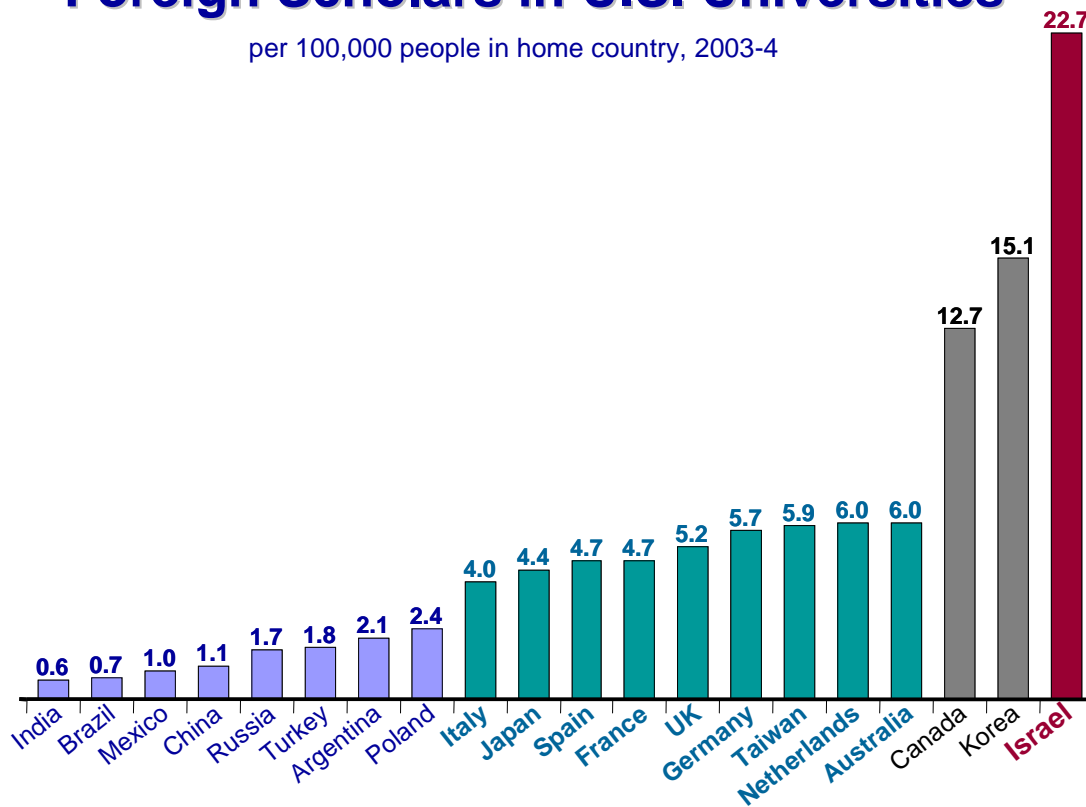
The third group consists of two countries, Canada and South Korea, who send 12.7 and 15.1 academics, respectively, to the States for each 100,000 people.

Israel leads all of the countries and is in a group of its own, with 22.7 academics in the States for each 100,000 Israelis. The share of scholars in America to domestic population

Figure 1

Foreign Scholars in U.S. Universities

per 100,000 people in home country, 2003-4



source: Dan Ben-David, "Soaring Minds: The Flight of Israel's Economists" (2007)
data from OECD and U.S. statistical abstract

from Israel is 51% higher than the number two country, Korea, 79% greater than the 3rd place country, Canada – and 4 to 6 times greater than the remaining first-world countries.

The number of a country's top academics in the States, with respect to that country's population (figure 1), provides one important indication – merging quality and the quantity – of the country's academic level. However, some countries may have many universities relative to their size while some may have many excellent scholars who prefer to stay at home.

Sharpening the focus on the brain drain issue, the interesting question is what proportion of a country's total number of academics is in the States. Table 2 paints a similar picture to Figure 1. While the percentage of scholars in America is between 1% to 4.5% for the majority of countries, it spikes up to 12.2% for Canada. The number of Israeli academics in the States is one-quarter of all of the academic scholars in Israel – twice the Canadian ratio and over 5 times the ratio in the other developed countries.

On the one hand, the Israeli academics in America consist of those who are on sabbatical or on leave, as is the case with professors from other countries. On the other hand, the official number of Israeli academics in the States does not include those Israelis who obtained American citizenship over the years and are no longer considered “foreign”.

The extraordinarily high number of professors from Israel who reside in the United States reflects a merging of two facts. First: the quality of Israeli academia is at a level that enables Israeli faculty to easily get absorbed in the States. The second fact: employment conditions in Israel, compared to the States, represent a large incentive for an outward exodus to America.

Figure 2, based on data from Gould and Moav (2006 and 2007), focuses on the other side of the picture – on those who emigrate from Israel. Gould and Moav examine men aged 30-40 in 1995. By 2002, 6.5% of the lecturers had left Israel – compared to 4.8% of the doctors, 3.2% of other scientists, 3.1% of the engineers and less than 2% for the others. After two more years, the rate of emigration rose in each of the groups. Among the lecturers, emigration rates rose to 7.8%.

Cohen (2007) points out a possible measurement problem related to the numbers that Gould and Moav base their findings on. The definition of “emigrant” is anyone who resided at least a year abroad until the end of the sample period. According to this criterion, lecturers taking a sabbatical abroad might be tagged “emigrants” when in fact they will return to Israel at the end of the sabbatical.

Gould and Moav (2007) respond to this issue and write that a comparison of emigration rates in 2002 to those in 2004 reveals that only 2.6% of the 6.52% – that is, $6.52\% \times 0.026$ – of the lecturers labeled as emigrants in 2002 had returned by the end of 2004.

Table 2

**Foreign scholars in the U.S.
as percent of academic
scholars in home country***

24.9%	Israel
12.2%	Canada
4.3%	Netherlands
4.2%	Italy
2.9%	France
2.9%	Germany
2.2%	Turkey
2.1%	UK
1.9%	Australia
1.8%	Poland
1.3%	Spain

* Foreign scholars data is for 2003-2004. Data on total number of domestic scholars is for 2002 except for France and Italy (2001), Australia and Turkey (2000), Canada (1999) and Israel (2003-2004).

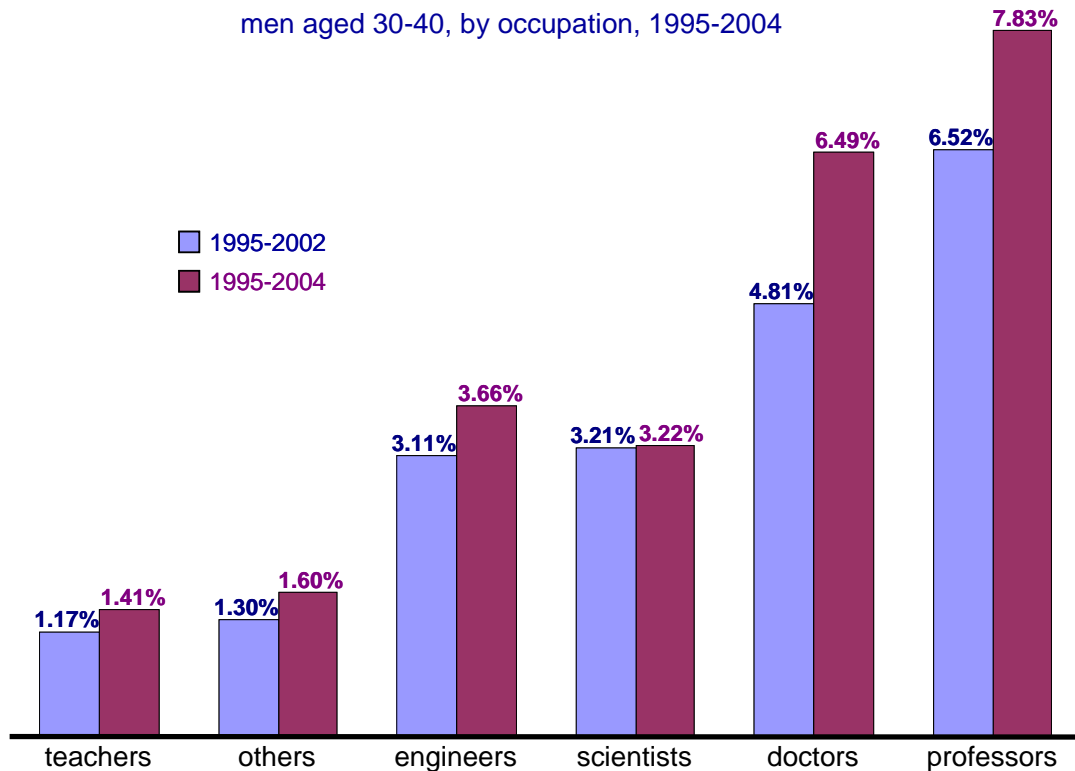
Data from OECD, European Commission, Israel Higher Education Commission, Statistics Canada and Australian Department of Education.

Source: Dan Ben-David, “Soaring Minds: The Flight of Israel's Economists” (2007).

Figure 2

Rate of Emigration from Israel

men aged 30-40, by occupation, 1995-2004



source: Gould and Moav (2006 and 2007)

Hence, the duration of stay abroad for the remainder by 2004 was at least three years (in other words, 6.35% of the lecturers were abroad, and had been abroad at least 3 years, in 2004).

Assuming that the rate of returnees from the 2004 data won't differ from the rate of returnees in the 2002 data (*i.e.* a return rate of 2.6%), then this implies an increase of 20% in the number of lecturers who left Israel between 2002 and 2004.

3. The Flight of Israel's Economists

When the focus turns to the area of economics, the mobility picture becomes a bit sharper. This is one of the fields in which Israelis have achieved world renown. Two Nobel prizes in Economics have been awarded to Israelis in recent years – to Daniel Kahneman in 2002 and to Robert Aumann in 2005.

Coupé (2003) uses academic citations on articles published in the years 1990-2000 to rank the 1000+ most cited economists in the world. Coupé's rankings were based on a

merging of the *Econlit* database, which includes all of the economics journals, together with the Thomson Scientific Web of Science (WoS) citations data base. Among the most cited economists during this period were a number of Israelis. Their location during the nineties and their location today provides an indication of both stocks and flows between countries at the top end of the profession.

The 13 leading economists in Israeli universities during the 1990s appear in Table 3.⁴ Of these 13 economists, 3 of those under retirement age are now employed full-time outside of Israeli academia. The two economists heading the list, Elhanan Helpman and Oded Galor, are now in American universities (Harvard and Brown, respectively) and one, Daniel Tsiddon has moved to the private sector in Israel.⁵

Coupé's top 1000+ economists includes a dozen additional current or former Israelis who held full-time positions in American universities in the years 1990-2000. While roughly a quarter of the Table 3 economists have since left Israeli academia, none of the dozen top-ranked Israeli economists in the States during this period has since returned to Israel. In fact, some of them actually made the move to the States during the nineties and have remained there since – among them a few with quite a number of years left until retirement.

Israeli economists are scattered along the length and breadth of American universities – including many of the top economics departments in the States. Many Israelis are not just

⁴ Coupé's ranking in table 3 is based on the number of citations during the 1990-2000 period weighted by the number of authors (1/n) and by the number of years since publication. Coupé used a number of different citation measures to rank the economists. While each particular measure may result in different individuals ranks, there is little change in the names of the leading Israeli economists during the 1990-2000 period. Since the objective here is to isolate the group of top-ranked economists in general, the individual ranks are of little importance in this regard and the use of any particular citation measure is immaterial for the purposes of this paper.

⁵ Officially, Tsiddon is on leave from Tel-Aviv University.

Table 3		
The most cited Israeli Economists in the World*		
in 1990-2000		
rank in Israel	rank in world	
1	17	Elhanan Helpman
2	115	Oded Galor
3	433	Ido Erev
4	589	Alex Cukierman
5	595	Ehud Lehrer
6	664	Ariel Rubinstein
7	736	Manuel Trajtenberg
8	858	Daniel Tsiddon
9	900	Dan Ben-David
10	933	Joseph Zeira
11	1209	Shmuel Kandel
12	1303	Eddie Dekel
13	1348	Shmuel Nitzan
* in Israeli universities source: Coupé (2003)		

there in visiting positions. They have become an integral part of the tenured and tenure-track faculty in many departments.

In fact, most of the top economics departments in the States include Israelis among their tenured or tenure-track faculty. Table 4 lists 20 departments of economics ranked among the top in the field. Among their 844 faculty members are 37 current or former Israelis and 3 Americans who held tenure or tenure-track positions in Israeli universities at one point in their careers (there may be more that I am unaware of). One of these is the Nobel laureate, Daniel Kahneman.

Why do economists leave Israel and remain abroad? The answers vary from economist to economist and they differ from one academic age group to another. Among the many individual motives, there are two primary reasons often given for the outward flight: salary differentials between the United States and Israel as well as the often-times problematic promotion processes in Israel.

For full professors who leave, the latter issue is obviously a non-factor. But even those below the rank of full professor are not oblivious to the gaps in salaries, and each individual has his/her own personal reservation price for continuing to live in Israel. When the gap increases, the reservation prices of more and more economists are crossed.

4. Salary Gaps

Salary differentials have always existed between Israel and the United States. The question is how these have behaved over the past decade (getting data on earlier periods has not been possible).

Table 4
**Some Top American
Economics Departments
with Israelis***

1	Berkeley
2	Boston Univ
3	Brown
4	Carnegie Mellon
5	Cornell
6	Dartmouth
7	Duke
8	Harvard
9	Iowa State
10	Maryland
11	Michigan
12	Minnesota
13	MIT
14	Northwestern
15	NYU
16	Ohio State
17	Princeton
18	San Diego
19	Stanford
20	UCLA

* Current/former Israelis or Americans who held tenure/tenure track positions in Israeli universities.

Looking first at the United States, average salaries across disciplines in Ph.D granting institutions in 2005-06 differed from private to public universities, with the former paying 29% more to full professors and 19% more to associate and assistant professors (AAUP 2006). A comparison of salaries in economics (from the American Economic Association Universal Academic Questionnaire Summary Statistics, 2006) indicates that economists in Ph.D granting institutions earn more than the average across disciplines – not surprising, given the non-academic alternatives for many economists in academia. Full professors of economics make 18% more than the mean for full professors in the States. Associate professors of economics make 27% more than the American mean and assistant professors of economics make 29% more. The gap between full and associate professors is 37% among academic economists versus 47% in general, compared to 15% between associate and assistant professors of economics (17% between the two groups in general)

In Israel, all Ph.D granting institutions are public universities. In contrast with the three academic ranks common in the States, there are four ranks in Israel. That said, there is however a great deal of similarity between the two systems as far as ranks are concerned. Untenured assistant professors in the States are comparable to untenured lecturers in Israel and full professors in both countries are relatively comparable to one another. The mid-level tenured associate professor position in the States is divided in Israel into two tenured mid-level positions: senior lecturer and associate professor.

Salaries in Israel are structured so as not to allow for any differences across disciplines, with minimal differences between individuals for excellence. In light of the fact that the average salaries of academic economists are higher than the average salaries of non-economists in the States, then the implication is that salary gaps between American and Israeli academic economists are greater than the salary gaps between American and Israeli non-economists.

Annual base salary increments in Israel are automatic and based on seniority alone. The base salary of academics in the country is low compared to the final compensation package. This is due to a number of supplements (for mobility, clothing, telephones, convalescence, and so on), which vary in size, that are added onto the base salary as a result

of collective wage bargaining agreements. The various supplements are detailed in the appendix.

One problem that arises when compensation is based so heavily on components that are not officially salary, are quite varied in number, and are paid in differing intervals, is that the average Israeli academic has little idea as to the actual size of his/her total compensation package. While this is the case for many resident Israelis, it is even more so the case for those who live abroad and are trying to compare earnings abroad with the Israeli alternatives. This imperfect knowledge acts as an impediment that may make salary gaps between the two countries appear larger than they may actually be.

Another factor that may cause salary gaps between the U.S. and Israel to appear larger is the fact that most people use official exchange rates (ERs) – rather than purchasing power parities (PPPs) – to translate Israeli salaries into dollars. This is especially true when the calculation is done for current salaries, since no PPPs exist until after a year or two have elapsed. While the average ER and the PPP in 1996 were nearly identical, a substantial gap between the two has materialized over the past decade. By 2005, the official exchange rate equaled 4.49 shekels to the dollar, compared to just 3.23 shekels to the dollar according to the PPP. In other words, when an Israeli abroad translates an Israeli shekel amount into dollars by dividing it by the ER, the calculated Israeli salary appears to be 28.5% less than what it actually translates into when divided by PPP. All cross-country comparisons in this study are made using PPPs (unless the measure that is focused on does not call for a conversion into the same currency).

The data for salaries begins in 1996. In lieu of the existence of data for average salaries for Israeli academics, the median seniority salaries will be used for each rank. Before the salaries of the two countries are directly compared to one another, one clear trend immediately jumps out from the data: they are headed in opposite directions (figure 3). The salaries of full professors in Israel fell by 1.6% in real terms since 1996. The salaries of associate professors fell by 2.4%, of senior lecturers by 1.7% and of lecturers by 1.3% in real terms since 1996. By contrast, the salaries of American full professors of economics rose by

15.7% during this period, while the salaries of associate professors rose by 18.9% and those of assistant professor rose by 23.6%.

To better facilitate comparisons by rank between the two countries, the untenured ranks in each will be compared to one another (assistant professors in the States versus lecturers in Israel). Similarly, full professors in each country will be compared to one another. The mid-level rank of associate professor in the States will be compared to the average of senior lecturer and associate professor in Israel.

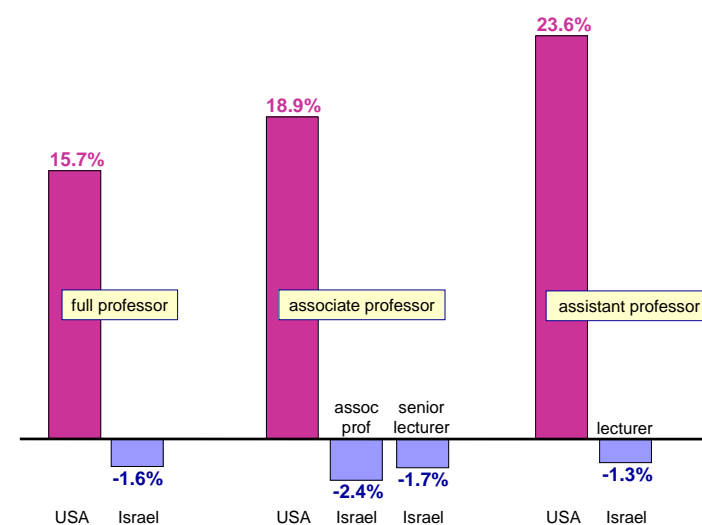
As is evident in figure 4, the salaries of American academic economists were approximately 50% higher among the tenured ranks and 62% higher among the untenured in 1996. The gap between the two countries then proceeded to rise steadily year after year. By 2006, full and associate professors of economics in the States received between 77% to 83% more than their colleagues in Israel. The gap between assistant professors rose to even higher levels, with Americans making more than twice the amount paid to Israelis.⁶

Of course, the point could, and should, be made that standards of living in the States are higher than in Israel, so salary differences could be expected – though such issues as ability to pay may not matter much to individuals with professional training that provides them with an extremely high degree of mobility between countries.

How does a professor's salary compare with his/her country's GDP per capita? In the mid-1990's, the ratio of salaries to GDP per capita in the two countries was relatively similar.

Figure 3

Real Change in Salaries, 1996-2006



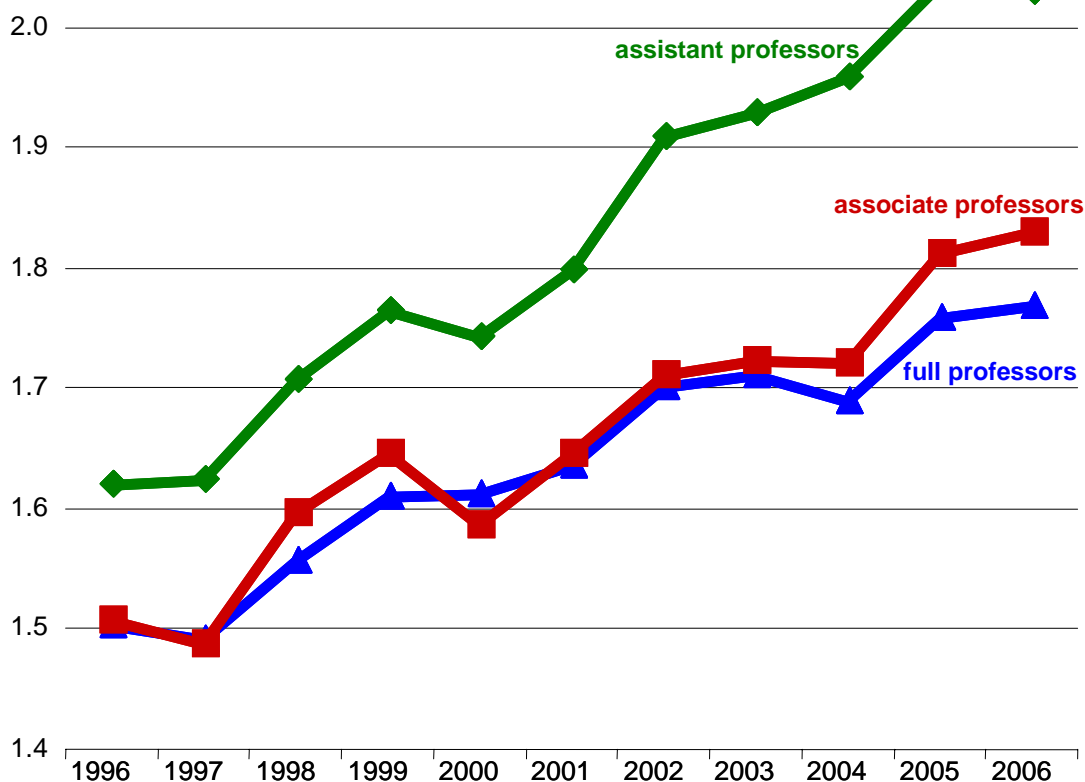
source: Dan Ben-David, "Soaring Minds: The Flight of Israel's Economists" (2007)

⁶ A heavier tax burden on academics in Israel makes the differences in net incomes even greater than those reported here. However, there was no significant change in the excess Israeli burden during this period, so this would not be a source of an additional widening of the income gap between the two countries. In fact, there has been a slight reduction in Israeli taxes during the past couple of years, a factor that has diminished the rate of increase in the *net* income gap – which is nonetheless still greater than the *gross* income gap reported here.

Figure 4

Salaries of Academic Economists in US relative to Israel

in 2005 ppp-adjusted dollars



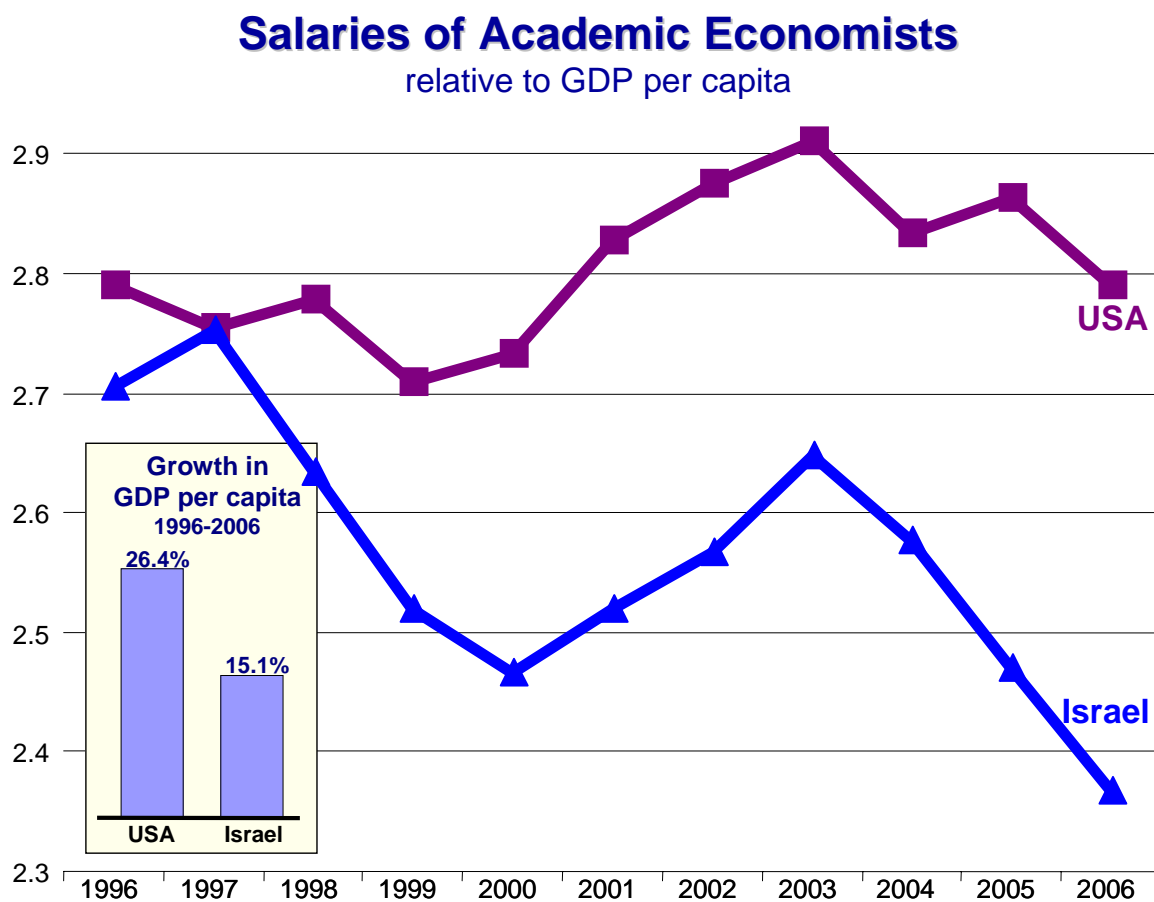
source: Dan Ben-David, "Soaring Minds: The Flight of Israel's Economists" (2007)

However, as can be seen in figure 5, since 1996, the salaries of economics professors relative to GDP per capita have behaved quite differently in the two countries.

The salary-GDP per capita ratio has been relatively constant in the States (with little variation between ranks), fluctuating slightly over the decade and ending up in 2006 at exactly the same level as in 1996. In Israel, on the other hand, the ratio of salaries to GDP per capita in Israel has fallen by 12.5% (with little variation between ranks) since 1996.

These comparisons provide some further insight into the growing academic salary differentials between the two countries. The first key explanation to these increasing differentials lies in the fact that the academic salaries of economists in the States kept pace with the economic growth of the country while the academic salaries in Israel eroded in value relative to the growth in GDP per capita.

Figure 5



The second key explanation is more ominous, with implications reaching far beyond academic salaries and into the realm of all professions in which cross-country mobility is high. As the insert in figure 5 indicates, per capita incomes in the States grew by 26% during the decade in question compared to a growth of just 15% in Israel.

In fact, Israel has been steadily falling behind the leading western countries since the 1970s. Average per capita growth in the United States since 1973 equaled 2.0% per year, compared to 1.6% in Israel. What this means is that while the average Israeli incomes rose by 69% since 1973, the average American incomes nearly doubled, at 95%.

In other words, although incomes in Israel have risen over the past three decades, the country has been falling farther and farther behind the U.S. in relative terms. One main consequence of this increasing income gap is an increasing difficulty in Israel to match salaries – let alone *close* salary gaps – of highly mobile segments of the population. With this

inherent economic problem lying in the background, the further erosion of academic salaries beyond the slow rate of economic growth simply exacerbates an already problematic comparison.

While the above comparison of salaries provides some insight regarding the profession as a whole in both countries, it should be pointed out that for top tier Israeli professors of economics who teach in the leading American universities (and who number roughly the same as the total number of economists in Israel's top two universities) – the differences between American and Israelis salaries are substantially greater than those listed here. The reason is that the top American universities can afford to compete and to pay much more than the national average, while the Israeli universities are considerably constrained in their leeway to vary salaries between professors of similar ranks and seniority.⁷

5. Inconsistencies in Promotion

While salary differentials are certainly important, particularly when these are regarded in cumulative terms over the life-cycle, they are not necessarily the over-riding considerations for all Israelis. In the case of newly-minted PhDs and young faculty, for example, the issue of promotion is a non-trivial consideration as information flows increasingly more quickly between individuals in Israel and individuals who have seen/experienced the alternatives abroad. While promotion decisions clearly incorporate salary implications – and therefore cannot be examined in total disconnect from the previous section – they also radiate an important message from the universities to the professors as to the value that the institutions attribute to the academic contributions of their faculty.

Table 3 provides some interesting insight regarding promotion decisions in Israel. Of the 13 individuals whose research impact placed them among the leaders of the academic economic world in the nineties, several did not receive local recognition for their work via promotion to the rank that most exemplifies academic excellence – the rank of full professor.

⁷ This institutional rigidity led the 2004 Israeli Nobel Prize Laureate in chemistry, Aaron Ciechanover, to state (Arlozorov, 2007) "I am unwilling to accept the current situation in which a faculty member who brings research grants, brings publicity, supervises students, is active in the university and publicly – receives exactly the same number of shekels as a faculty member who sits with his hands folded and does nothing."

In fact, even today, seven years into the subsequent decade, some of the researchers on this list have not been promoted to full professor.

A separate ranking of all 189 academic economists in Israel Ph.D granting institutions (Ben-David, 2007) shows a considerable discrepancy between the research impact of economists – as measured by the number of times that their work is considered a sufficient contribution to be cited in subsequent academic work – and the academic rank accorded them in the promotion process characterizing Israeli universities.

In Israel, lecturers and senior lecturers are referred to as “doctors” while associate and full professors are called “professors”. There are 133 professors of economics, 55 doctors of economics and 1 non-Ph.D on the senior academic staffs of Israel's major universities.

40% of the economists in the bottom third of the ranking ladder are professors. *Above* them, in the middle third of the ranking ladder, 25% of the economists have not been promoted beyond the rank of doctor. In the top third of the ranking ladder, there are two doctors with more citations on their work than the total number of citations received by most of the full professors in the top two economics departments in the country.

In contrast with the States, there are no shortcuts in the Israeli promotion process for high impact research that makes its mark quickly. Each person must await his/her turn and can be awarded a promotion only after minimum amount of time has elapsed since the earlier promotion. Offers from other academic institutions are insufficient grounds for skipping promotion phases. More than a few Israelis experience these norms, or gaze at them from afar, and ultimately vote with their feet. The alternative preferred by many is to reach the final stages of the promotion process in the States before returning to Israel. The problem is that by the time that they eventually become full professors, it is too late for some to make the move back to Israel.

A small experiment by Omer Moav (2007) is suggestive of the trends in decisions that have been made over the decades. Moav focused on the Israeli economists located today in the top 30 economics departments in the U.S., the top 2 departments in the UK, and the top 2 departments in Israel. He divided the Israeli economists by the decade in which they completed their Ph.Ds and sorted them by where they are today. Table 5 reflects a very clear

change in the choices made by the economists. Almost half of the top economists who graduated during the past half century have chosen to live abroad. The balance shifted in the nineties, with a majority of the recent graduates opting for life in the U.S. and the U.K.

The table, in and of itself, does not necessarily imply a change in behavior since it is very possible that newly-minted Ph.Ds may

prefer to stay in the States immediately after completion of their studies and may later decide to return to Israel. However, the implosion that is occurring in Israel's top economics department suggests a substantial shift in the choice of country.

6. Economics in Tel-Aviv University – An Israeli Example

According to Coupé (2003), the total number of citations received by the department of economics at Tel-Aviv University between 1990 and 2000 placed it in 24th place among all economics departments in the world – this despite the fact that it was a much smaller department than most of the top American departments (the average number of non-emeritus faculty members averages about 40 in the higher ranked U.S. departments).⁸ When the comparison is in citations per faculty member, then Tel-Aviv – with roughly 25 senior faculty during the nineties – was tied with Princeton for 14th place internationally and was in sole possession of first place among all departments outside the United States.⁹

What a difference a decade makes. There were 25 faculty members listed on the web site of the Department of Economics at Tel-Aviv University during the 2006-2007 school year. Of these, 7 are retired (most of them, recently).

⁸ This is after correcting a mislabeling error in the Coupé article regarding the home university of Alex Cukierman, a correction that raises the Tel-Aviv department by two slots, from 26th to 24th place. An alternative departmental ranking for the 1990s by Süßmuth, Steininger and Ghio (2006) lists 200 departments in Europe on the basis of *AER* standardized pages published in the top 8 core journals (*AER*, *Econometrica*, *JPE*, *QJE*, *JME*, *JET*, *REStud*, *REStat*). Their findings place Tel-Aviv University in 1st place and the Hebrew University in 3rd place.

⁹ The crude assumption being made here is that the current size of the other departments represents a first best approximation for their average size during the nineties.

Year of Ph.D completion	Currently in Israel	Currently in US or UK
1960-1969	17	4
1970-1979	14	10
1980-1989	13	10
1990-1999	8	9
2000-2006	6	17
total	58	50

source: Moav (2007)

Of the 18 remaining non-emeritus faculty in the department, 7 are the academic equivalent of migrant workers, simultaneously holding additional academic positions in universities abroad. Cross-fertilization is, without question, part of the indispensable ingredients enabling academic life to flourish and prosper. That is the purpose of conferences, seminars and other professional meetings. Periodic sabbaticals and/or leaves of absence are intended to enhance interaction among researchers.

However, it is a bit of a stretch to rationalize semi-permanent or permanent simultaneous positions – requiring teaching – at other academic institutions as essential, as is evidenced by the very limited replication of this behavior by American departments. But for many Israeli scholars, this is the only way to attain minimum desired standards of living while maintaining a concurrent presence in Israeli universities.

The inevitable outcome of seasonal academic migrant behavior of this magnitude is that a substantial number of first-class researchers do not contribute as much to their colleagues and students in Israel as they could have, had they remained in the country during complete academic years. Another resultant outcome is that the decision to quit the migrant lifestyle eventually leads to a choice by several to go full-time in America rather than in Israel.

In addition to the faculty with joint appointments in other academic institutions, several members of Tel-Aviv's department of economics have gradually moved to full-time positions outside the academic world altogether, be they in business or in government. While some may eventually return to a full-time academic environment, the bottom line is that in what was – until recently – one of the most important bastions of economic research outside the United States, there are today only 8 full-time faculty members without formal outside appointments or positions that take them away from the university on a regular basis for extensive amounts of time each year.

Of these 8 faculty members, several are approaching mandatory retirement age. This is a predicament that is unparalleled among the top American departments, who average approximately 40 full-time faculty members at any given time. It is a predicament that the other major Israeli economics department, at the Hebrew University, is barely able to

improve upon. The speed and the extent to which Israel's top economics departments are disintegrating are very problematic omens for the future of Israeli academic economics in particular, and for Israeli academia in general.¹⁰

Assaf Razin (2007), one of the leading economists in Tel-Aviv University's department of economics – who will be reaching mandatory retirement in a few months (and then will continue abroad with his other academic affiliation, at Cornell University) – probably sums up the implosion better than most: “Our school is not able to get almost anyone who is academically successful abroad. To make the problem even more acute, ... the recruitment of young faculty [has] dried up, ... existing members chose early retirement, some middle-aged active faculty turned to either successful business, or to policy-making careers. The School of economics as we have known it over the last 3-4 decades is now virtually gone. Has it gone forever?”

The question is probably less about the elimination of the top economics departments in Israel and more about the possibility that these departments will slip into a mediocrity trap.

The problem in Israel is not a lack of people interested in getting doctorates in economics. The economics Ph.D programs are booming, with more students registering than at any time in the past. One of the primary explanations for the higher number of doctoral candidates studying in Israeli universities is the large increase in the number of undergraduate colleges during the past decade, and the need to staff these.

The problem is in maintaining a critical mass of high quality researchers that once were the mainstay of Israeli economics in its research universities. Today, as in the past, the top students interested in studying for a Ph.D are strongly encouraged not to get their doctorates in Israel, but to apply to the top American universities. This was the talent pool that – in the past – fed the staffs of the top Israeli departments of economics.

¹⁰ While the problems discussed above are particularly acute in the fields of economics and business, there are signs that these maladies are beginning to afflict additional disciplines in Israel as well. Eyal Chowers (2006), a recent chairman of the political science department at Tel-Aviv University, who lost 8 senior faculty in recent years (the current number of department members is 16), writes “in those areas in which the university has, or had, first class researchers, it is losing them – just as the leadership and academic contributions of those who are leaving are reaching their peak.”

Given the immense value of exposure by Israelis to the wealth of knowledge in America's top departments, the point of this paper is not that the flow of top students to the States should be stemmed. This is, after all, an issue of economies of scale at the top of the research pyramid. Israel is simply too small to have any comparative advantage in bringing its best students to the frontiers of the international knowledge envelope.

What has transpired over the past decade between the American and Israeli universities is reminiscent of what has occurred within the States between American universities. Increasingly tight budget constraints have limited the ability of public American universities to compete with the top private American universities. This, in turn, has led to a fall in the ratio of salaries of professors at public higher education institutions relative to salaries of professors at private higher education institutions (Ehrenberg, 2003). The ratio of salaries in public versus private universities declined from 91% in 1978 to 79% in 1993 and it has remained close to that level since then.

This made it increasingly difficult for the public universities to attract and to keep many of the top researchers. The result, as Ehrenberg (2004) reports, is that economics department faculty quality (as measured by the National Research Council) fell in those departments that did not experience salary increases at the rate that they rose in competing economics departments. Ehrenberg adds that, in addition to the resultant declines in quality, many of the public universities have reduced the proportion of traditional tenure and tenure-track positions among their academic staff.

While the origins of the shift toward the non-tenured may not be identical in the two countries, the American outcome is a fairly good reflection of what has been happening in Israel as well over the past decade. When its leading researchers opt for American universities, the top Israeli economics departments have had to choose between two problematic options: lowering the quality threshold for tenure and tenure-track faculty – a move that will be difficult to overcome for decades thereafter – or becoming increasingly reliant on adjunct and visiting lecturers who are not a part of the permanent staffs. The choice thus far has been the latter.

Many of these outside teachers work full-time in the private and public sectors and use the teaching positions to supplement their incomes. Hence, not only is there a decline in the number of top economics researchers, the next generation of students is increasingly being taught and supervised by individuals who are not at the forefront of the economic science. Their exposure to state-of-the-art ideas, theories and findings is becoming more and more limited.

In other words, academic economics in Israel's research universities is less in danger of total collapse than it is of sliding into a mediocrity trap from which it will become extremely difficult to emerge.

The link between academic research quality and compensation has been highlighted recently by two papers whose findings have a non-inconsequential bearing on what is occurring in Israel's universities. The first study, by Ehrenberg, McGraw and Mrdjenovic (2006), looks for a relationship between faculty quality (using the 1995 National Research Council ratings of faculty quality) and salaries by discipline, department and rank in 75 primarily public universities in the United States in 1992-1993. They find that higher faculty quality among 1894 full professors is significantly related to higher average salaries. However, they do not find a significant relationship of this type between associate and assistant professors. According to EMM this non-significant relationship is primarily due to the large impact of full professors on the quality ratings of departments.

What the EMM finding might mean within the Israeli context is that while salaries would appear to be the primary incentive for attracting top full professors, the way to attract top researchers in the lower ranks may be a mix that includes ingredients outside the immediate salary realm. For example, a department that combines the presence of full professors who are among the leaders in the field with the possibility for fast-track promotions for the more gifted among the lower ranks offers a strong research externality as far as environment is concerned, and a monetary incentive in the form of compensation that may be reached quickly if the promotion is quick.

The second paper, by Boyle (2007), focuses on the reverse link – that is, between salaries and research quality – in his examination of academia in New Zealand. Research

quality in 41 different disciplines in New Zealand universities is determined by Performance Based Research Funding (PBRF) grades. University salaries in New Zealand, like in Israel, are determined by rank and vary only marginally across and within disciplines.

Using differences in academic salaries between the United States and New Zealand to reflect the better-paying alternatives that high quality academics from New Zealand face – be they in academia in the States, or in the private sector domestically within New Zealand (in the latter case, the assumption is that academic salary differences across disciplines in America are correlated with differences in non-academic salaries across disciplines in the U.S., as well as in other countries) – Boyle found that the higher the salary gap in a particular discipline is between the two countries, the lower the quality of academic research is in that particular discipline in New Zealand.¹¹ The better researchers have alternatives, and when these alternatives become relatively more attractive, be they in academia abroad or in the business sector at home, then the impact on academic research follows.

7. Summary

The problems faced by Israel's universities in general, and by its academic economics department in particular, are a partial reflection of the overall decline of education in the country. The professors of the 1980s and 1990s were the products of an educational system that was ranked number one in the world in the early 1960s.¹²

The professors of the future will come from today's children. Scores in international math, science and reading exams during the latter half of the 1990s and early 2000s place Israel's children below all of the countries in the industrialized world as well as below the children in many developing countries. As shown in Ben-David (2003), even the top 5 percentile of Israeli pupils placed poorly in comparison with other countries. In the combined average grades of the TIMSS math and science exams taken in 1995 and 1999, the top 5 percentile of Israelis were ranked 35th out of 53 countries. This is not a good omen.

¹¹ Unfortunately, it is not possible to conduct a similar experiment in Israel since no quantifiable and comparable assessments of research quality are available within or across academic disciplines in the country.

¹² Hanushek and Kimko (2000) report scores on international math and science tests by junior high school pupils in 1963.

When over a fifth of its university academics are already in the States, when the proportion of its population serving on the staffs of American universities is over fifty percent greater than the second place country (and 4 to 6 times greater than other first-world countries), when the rate of emigration by university lecturers is higher than any other group in Israel – and rising each year – then Israel is facing a loss-of-excellence crisis unparalleled by other countries. The direction in which its top economists are headed has become increasingly uni-directional: westward ho.

Keeping the best and brightest in Israel in all fields is a necessary, though insufficient, condition for ensuring that the country's overall standard of living and rate of economic growth will converge to the levels of the world leaders. This involves an Israeli internalization that a new approach – currently out-of-the-box in Israeli academia – is needed.

In the realm of monetary compensation, there are two main routes for examining how a society compensates its academic researchers. The first is to measure how their salaries compare to the national income per capita. In this case, both the United States and Israel, despite their highly different approaches toward compensation of faculty, provided similar academic compensations when compared to average incomes in each of the countries in 1996 (though the ratio of salaries by top researchers to GDP per capita was much higher in the States). However, while America maintained a relatively stable ratio of salaries to GDP per capita over the past decade, this ratio fell substantially in Israel between 1996 and 2006.

The second route for salary comparison is the out-and-out comparison of dollar amounts paid in each country. While this form of comparison ignores the country's capacity to pay, it nonetheless takes into account the very highly mobile nature of the profession. In a sense, what this comparison would appear to indicate is that in poorer countries that wish to keep their academic researchers, the compensation that they provide their researchers needs to be given a higher priority – out of GDP per capita – than is the case in the States.

Differences in monetary compensation alone are insufficient for explaining why an increasing number of top Israeli researchers prefer to leave Israel or to remain in the States. The extremely long, cumbersome and often-times arbitrary and excruciating promotion process in Israel leads many to bail out and move to more accommodating environments

abroad, or to simply avoid the process altogether and reach the top rank of full professor in foreign universities – with the frequently unstated objective of returning to Israel at that rank once the top position has been realized.

The problem is that life does not always turn out as planned. One common scenario is that even if the original motive may not have been to permanently leave Israel, the associated process of beginning a family in the States during the critical promotion years often leads to non-reversible situations in which spouses become firmly ensconced in jobs while children – and sometimes, their parents too – become firmly ensconced in the American Dream. The drive to return home diminishes with time and with U.S. salaries, and it never even has the chance to take hold among many of the children who grow up in the States and are familiar only with American customs and habits.

The basic ingredients to any solution regarding the exodus of academics from Israel involve the merging of accountability with authority. There is always a delicate balance that needs to be maintained between the provision of sufficient degrees of freedom and flexibility at the departmental level while simultaneously preserving academic norms, standards and quality. However, the extent of the flight from Israel's top departments and the degree to which Israelis have been able to penetrate top American departments and are hesitant to return home would appear to indicate that the current Israeli university system is not coping adequately with a situation that has grave implications for the future.

The lesson here is not only for academic departments in Israel. In a world with increasing mobility of the top researchers, what has already begun to materialize in Israeli universities can occur in departments that are currently at the top of their field elsewhere. Academic excellence in an institution and in a country cannot be viewed as divine destiny. It is an entirely endogenous outcome of policies.

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Appendix

The base salary of university faculty members in Israel is augmented by a number of salary supplements. The first is an amusingly titled, but substantial, wage supplement called “mobility, clothing and telephones.” This is a constant amount that is independent of seniority which adds 60% to the salary of a full-professor with 10 years seniority (assuming the actual existence of such professors in Israel) and 40% to the salary of a full-professor with 35 years seniority.

Associate professors not only receive lower base salaries, but their “mobility, clothing and telephones” (MCT) supplement is also 20% less than that of full professors (they are apparently expected to be less well-dressed and use their phones less). The contribution of this fixed (*i.e.* unrelated to seniority) MCT supplement ranges from 56% for associate professors with minimum seniority to 46% for those with maximum seniority. There is an additional double digit percentage falloff in the MCT supplement from associate professors to senior lecturers and yet another double digit percentage drop for lecturers.

Another major source of income emanates from what are called “criteria” and “devotion of full-time” supplements, each adding roughly 13% to the salary. The criteria supplement provides – among other things – an incentive for prioritizing quantity over quality, *i.e.* producing many articles at the expense of fewer, but higher impact, ones. It is possible to receive just a portion of this supplement depending on the number of criteria checked off by the researcher.

The stipulation for receiving the devotion supplement is that one not receive income of any significance from external sources. This can create a tax of over 100% on the initial amounts earned elsewhere since what one gains from the alternative income source is only part of what one immediately loses from the university. The incentive then is either to submit to receiving the university salary only, or to make the jump to a significant source of alternative income – which in turn means that one devotes, by definition, very little time to the university position.

Interestingly, information regarding the amounts paid through these supplements (to be referred to here as C-FT supplements) is quite difficult to come by. Most, though not all,

faculty members receive C-FT supplements and not all who receive C-FT supplements receive the full amounts. The income supplement calculated here is based on C-FT data by university rank from Israel's Council for Higher Education for the years 1996-2005 as well as data from Israel's Central Bureau of Statistics for the total number of university faculty by rank. The proportional addition of the C-FT supplement to the sum of base salary and the academic supplement has been relatively stable over the years. This income supplement turns out to be biased by rank: a 21.7% increment to income for full professors, 20.7% for associate professors, 18.1% for senior lecturers and 13.8% for lecturers.

An additional amount that is added onto the faculty member's salary is called "convalescence payment". In theory, these amounts are identical for all faculty members irrespective of rank. However, there is one amount for faculty with 9 years and up of seniority and a smaller amount for faculty with 8 and under years of seniority. In light of the structured seniority ladders for each rank, there are no full professors that can have less than 10 years seniority while there are no lecturers that can have more than 6 years seniority – hence, full professors receive more than lecturers, by definition. On the other hand, when it comes to the percent addition to salaries by rank, the difference in the 9+ and 8- amounts is outweighed by the difference in salaries between ranks. Therefore, the percent increment (that is, the addition to base salary plus academic supplement) received by full professors is 2.8% and ranges through 3.5% for associate professors, 3.8% for senior lecturers to 4.0% for lecturers.

In contrast with their American counterparts, Israeli academics are not generally allowed to ask for or to receive salaries from research grants (there are few exceptions to this rule and these are generally for relatively small grants). Instead, the institution receives the grants and provides the researcher with a fixed percentage increase to the individual's salary that is tied to the overall size of the grant, a procedure that is biased towards the physical sciences and acts as a major reduction in the incentive of Israeli economists to apply for grants. Given the high variability in receipt of grants between individuals and in the resultant compensation received by each, and in light of the fact that activity in this realm is not an integral part of the formal compensation provided by universities – even though the

compensation per researcher per grant is much greater in the States – grant money will not be included here as part of the regular compensation package in either Israel or in America.

Israeli faculty accrue an additional two months salary that is paid when on sabbatical instead of the usual salaries. The actual amount paid is dependent on whether the sabbatical is abroad or in Israel. The primary financial advantage of the Israeli sabbatical is that it enables the individual to continue receiving an income from the university while receiving additional income – if possible – from the place of sabbatical. For the Israeli academic that either stays in Israel for his/her sabbatical, or spends it abroad in some non-income producing capacity, the financial implication of the sabbatical is negligible.