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Brain Drained

Part 2: A Tale of Two Countries

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This is the second of a two part series of articles providing a comparative examination of how universities in two countries, the United States and Israel, have evolved over the past few decades – and how differences between the two have culminated in a rate of academic brain drain from the latter to the former that is unparalleled in the western world.

The first article concentrated on the extent of academic migration to the States while this article focuses on how different higher education policies in the United States and in Israel led to the academic migration.

These two articles are based on a couple of recent CEPR paper by the author.

While the number of European scholars in America ranges from 1% to 4% of the scholars in their individual home countries, 73% of those who received their PhDs in the States have indicated that they would prefer to remain there (European Commission, 2003).

Sounds far-fetched? A look at what has already happened to Israel should serve as a warning that this is not a number that Europe should take lightly. The number of Israeli academics in U.S. universities has already reached 25% of the scholars still remaining in Israel, and there is no clear end in sight for this freefall.

Given the importance of frontier academic research universities in the growth of nations – particularly in this new millennium – there is a lesson here that Europe needs understand well if it wishes to avoid the Israeli predicament.

The Way We Were

The Israel that attained independence in 1948 had a total population of 825,000 and two universities – the Hebrew University in Jerusalem and the Technion in Haifa. These universities had a combined senior faculty of 118 professors and lecturers who taught 1,635 students. Within the next two decades, seven major research universities were up and running. By 1973, these universities had a combined senior staff of 4,389 professors and lecturers and 50,000 students.

Today, all seven universities are ranked among the top 500 in the world, while four of the Israeli universities – Hebrew University, Tel-Aviv University, the Technion and Weizmann Institute – are among the top 150 (ARWU, 2007).

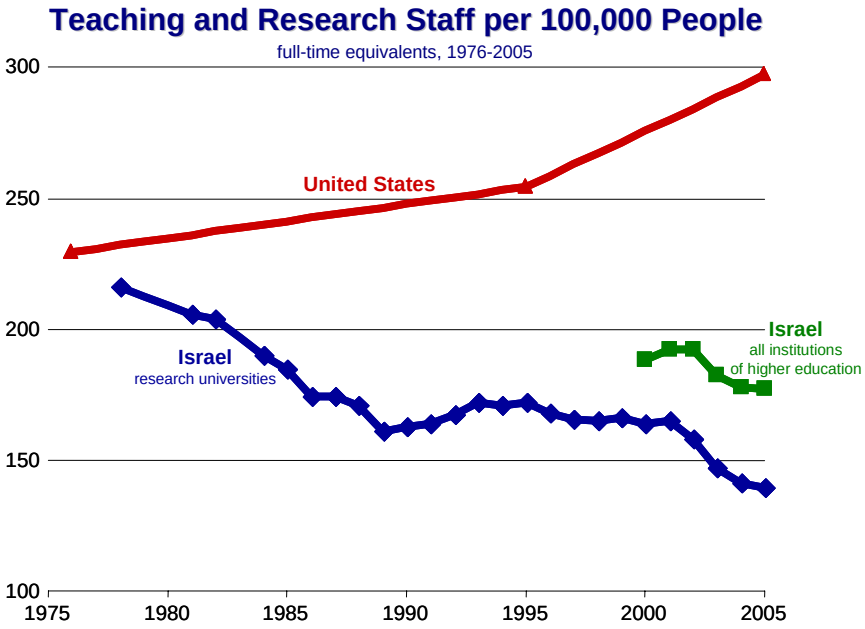
In many respects, Israel reached a pinnacle in 1973. That year, it was surprised in a massive all-out war launched by Egypt and Syria. In the war's aftermath, the country changed direction – in its leadership, in its functioning and in its national priorities. The implications of this change on the country's system of higher education had been less obvious, until recently.

Academic Positions

The turnaround in policy since the seventies is striking. After the relatively poor Israel brought its teaching and research staff size per capita to near-American levels in the mid-seventies, the much wealthier (by then) Israel chose a markedly different course than America's. While the number of teaching and research personnel per 100,000 people in the

States rose by 29% from 1976 to 2005 (Figure 1), this measure fell in Israel by 35% between 1978 and 2005. Even the addition of non-research academic institutions in recent years did little to change this overall picture. By 2005, the number of teaching and research personal in all of Israel's institutions for higher learning fell to a level 40% below America's.

Figure 1



As the number of academic positions per capita in Israel was being reduced, the number of students soared. In 1970, the United States granted three times as many degrees per capita as did Israel (Figure 2). Over the course of the next three and a half decades, the number of American academic degrees per capita rose by 31%. In Israel, the number of degrees per capita rose by 355% and surpassed the American mark by 13% in 2005.

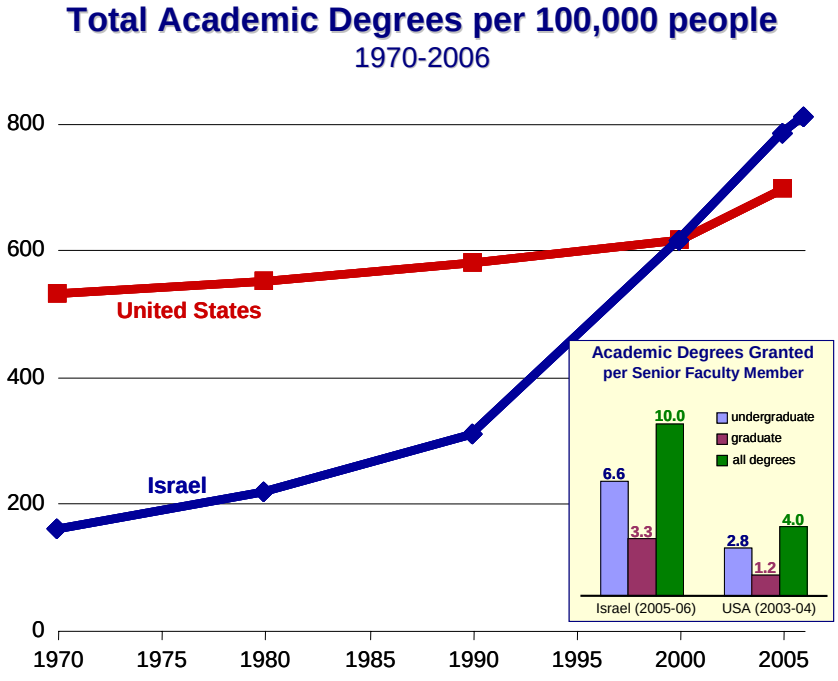
The outcome of this can be seen in the insert to Figure 2. The number of undergraduate degrees conferred per senior faculty member in Israel is 2.4 times the number in the States. The ratio of graduate degrees to senior faculty in Israel is 2.8 times the U.S. ratio.

University Revenues

In 1980, the ratio of total university revenue to GDP was roughly 1.4% in both Israel and the United States (Figure 3). Over the subsequent decades, the ratio of university revenue to GDP changed for both countries, rising to 1.8% in the U.S. by 2000, and falling to 1.1% in Israel in 2005.

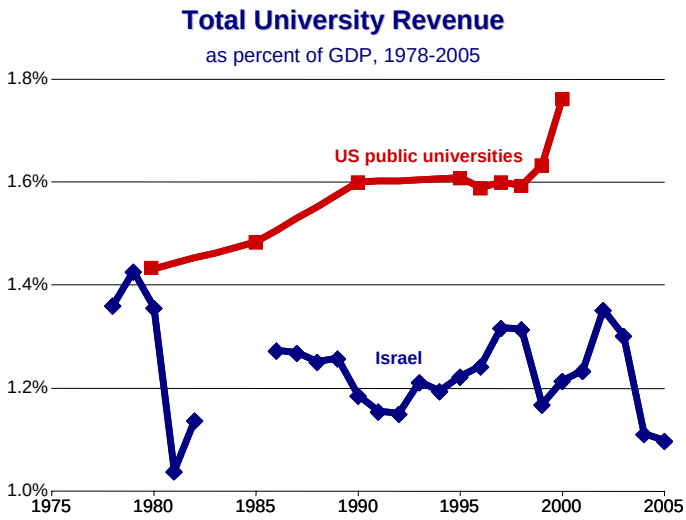
As indicated in Figure 4, Israeli universities are much more dependent on government funding than are public universities in America. In 2000, tuition and private contributions accounted for roughly the same share of revenues in both countries, less than a fifth for the former and just over 5% for the latter. On the other hand, over two thirds of the higher education income in Israel came from the government, compared to 51% in American public universities. The resultant increased dependency of universities in Israel on the state of the economy, and on the whims of political currents and undercurrents, has considerably reduced the degrees of freedom available to them in the realm of planning, growth and emphasis.

Figure 2



An indication of how problematic any long-term planning can be under these circumstances may be understood from a multi-year look at the data. Over the years, the government component of public university revenues has been much more volatile in Israel

Figure 3



than in the States. Averaging 63% between 1977 and 2005, it spent 7 years (in different periods) above 70% and 10 years below 60%, settling on the average of 63% in 2005. The government component of public American university revenues, on the other hand, exhibited a steady decline from 62% in 1980 to roughly 50% during each of the years in the latter half of the nineties.

The tuition portion of revenue in the two countries appears to be headed in opposing directions. In America, the share of tuition out of GDP per capita rose from 8.5% during the 1988/89 academic year to 14.7% in 2005/06. The situation in Israel was nearly the mirror image, with the ratio of tuition to GDP per capita falling from 15% to 9.6%. The large increase in the number of Israeli students has thus far prevented a decline in tuition revenue as a share of GDP – while in the States, this ratio has been rising.

Salaries

While academic salaries in the States vary considerably (Figure 5),[1] salaries in Israel's universities are determined according to a uniform pay scale within the framework of collective wage bargaining agreements between the country's finance ministry and the union representing senior faculty. There is no distinction between universities nor between disciplines. Rank and seniority are the primary factors distinguishing between paychecks.

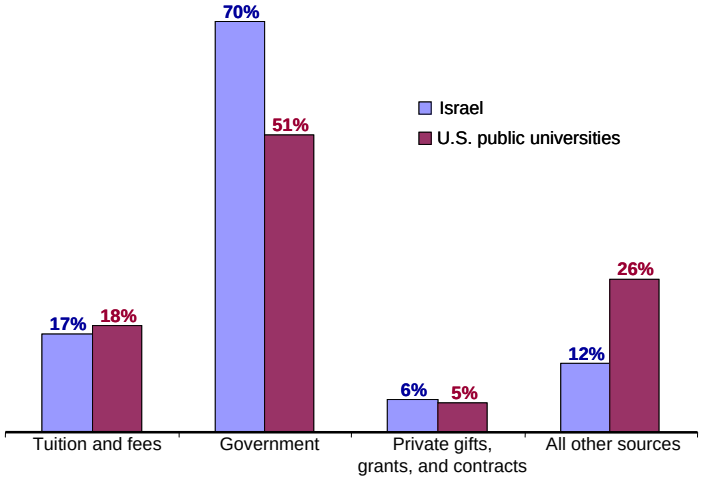
As academic salaries in the States have risen in real terms over the past decade, academic salaries in Israel have fallen – and the gap that had already existed between American and Israel academic salaries only increased. In addition, salaries in competing sectors within Israel rose by a considerable amount, only enhancing the relative erosion of academic income.

Figure 6 shows that those fields with the highest rate of Israeli migration to the top American schools were also the fields that paid considerably higher salaries. Salaries in physics, chemistry and philosophy are within 10% of the American academic median. Average salaries in economics are 15% higher, while salary disparity within the field is also considerably higher (by 46%) than the median standard deviation. This suggests that leading economists, who are presumably at the top end of the field's salary ladder, receive quite a bit more than the 15% difference between economics and the academic median.

This scenario is even more pronounced in computer science. Average salaries in the field are 26% greater than the academic median while income disparity within the field exceeds the academic median standard deviation by 60%. Hence, it is likely that the large number of Israeli computer scientists with positions in America's best departments are also probably receiving the highest salaries, compared to the four other groups.

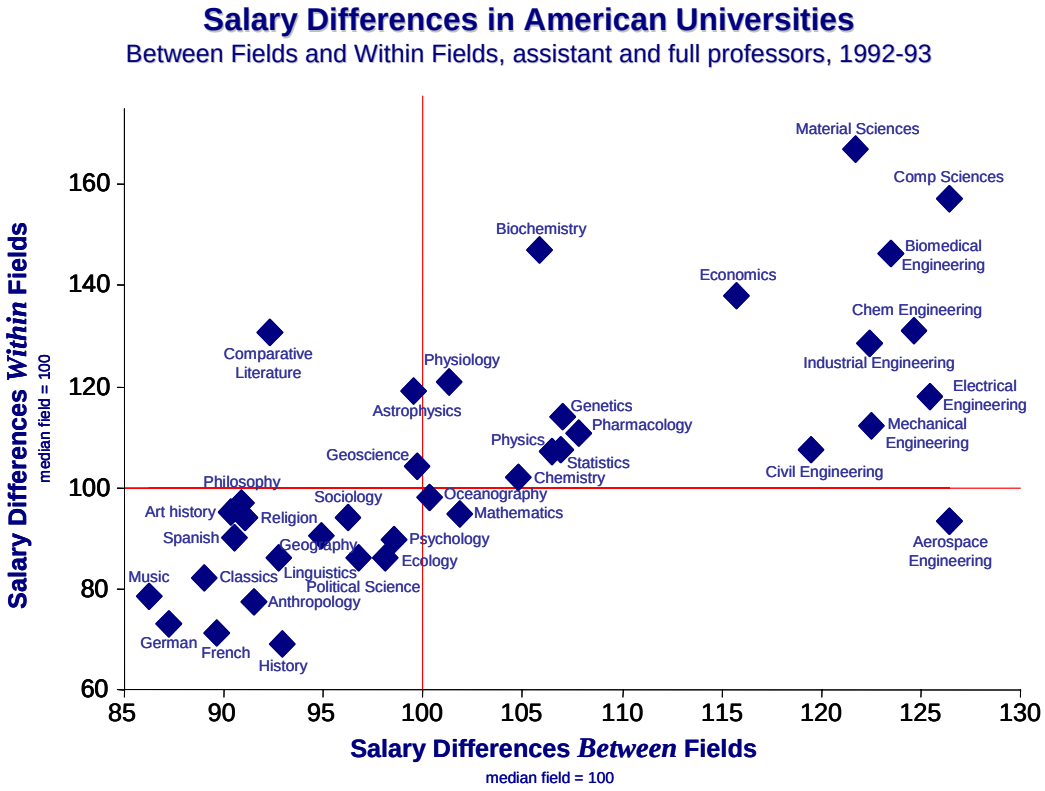
The fact that there is a considerable brain drain in the three fields close to the median American salary would appear to indicate that salaries alone are an insufficient explanation. However, when salary differences become particularly large, then it is possible to see that emigration rates increase as well.

Figure 4



[1] Figure drawn on basis of data reported by Ehrenberg, McGraw and Mrdjenovic (2006).

Figure 5



Policy Implications and Conclusion

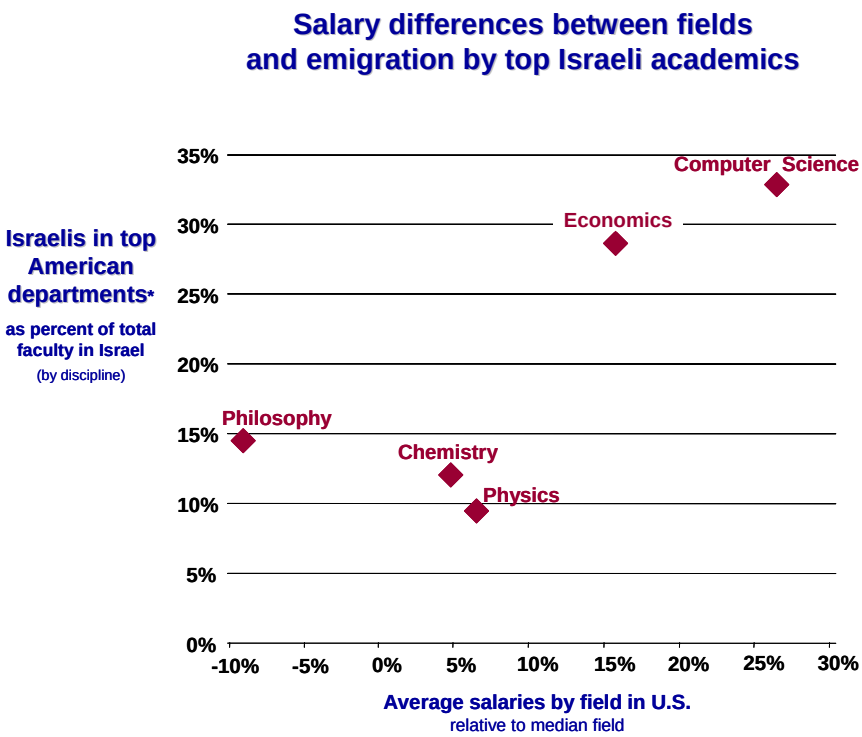
It is ironic, to say the least, that a country with no natural resources, which has discovered the high-tech route to raising per capita incomes, could have adopted policies that have led to such a predicament. In the very fields necessary for fueling the minds that enter the high-tech market, Israel has allowed itself to lose an unparalleled proportion of its top researchers.

There are four main reasons for the emigration of many of Israel's leading researchers from its universities: insufficient positions, relatively low salaries, inadequate funding of research laboratories and an archaic institutional organization that inhibits change, adaptation and competition.

The twin issues of salaries and antiquated institutional organization are bound together in a Gordian knot. The bureaucratic mindset that pervades all of Israel's public sector – including its universities – is one of extensive micromanagement by external bodies. There is a need to separate between determination of priorities, allocation of budgets and oversight on the one hand, and the merging of accountability and the authority to implement on the other hand.

But it is not just a question of efficiency. There is also an issue of recalibrating national priorities – rethinking what the value of a higher education means for those who attain it and what the resultant knowledge spillovers mean for the economy and society in general.

Figure 6



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