

# The Cost Of More Accessible Higher Education: What Is The Monetary Value Of The Various Academic Degrees? A Case Study

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## ABSTRACT

*One of the main reasons for acquiring a Bachelor's Degree is the perception of higher education as a means of improving graduates' financial status. In light of the increased accessibility of higher education, a growing number of students hope to use their studies as a financial springboard. In the current study we sought to examine this perception and to check whether and to what degree baccalaureate degrees indeed improve graduates' financial situation. In cooperation with Israel's Central Bureau of Statistics we gathered data on 6,091 graduates who completed their studies at the Ariel University Center during 2000-2008. Data analysis included exploring graduates' rate of employment and monthly salary from the day they began their academic studies until eight years later. We divided and distinguished between graduates by discipline and gender. The findings show that graduates earn almost three times the national average salary (and five times the median salary) and indicate employment rates of nearly 100%. Analysis of findings by discipline indicates that the most profitable fields are computer sciences and mathematics, engineering, and architecture. Salaries in the natural and social sciences and in the humanities are significantly lower both compared to the former fields and to the national average salary, at least for this eight year span. Analysis of the data by sex showed that the rate of employment among men is 12% higher than among women and that there is a disparity in employment within each discipline as well. Research conclusions show that academic degrees per se are not a guarantee of financial or occupational security. Employees with degrees in the social sciences and the humanities may find that their pay is no higher than those with no degree. One of the implications of this issue, already evident at this stage is that students are attempting to attain higher degrees in the hope of improving their financial status. The equation of a higher education with a higher income seems to involve other components as well, such as graduates' field of study, seniority on the job, and field of occupation.*

**Keywords:** Monetary Value of the Various Academic Degrees; Ariel University

## 1. INTRODUCTION

The accessibility of higher education, and particularly of baccalaureate degrees, is a major issue for schools of higher education in recent decades (Altbach et al., 2009; Kazis et al., 2004; Tierney & Sagedorn, 2002; Guri-Rosenblit, 2000). Since the first university was established in the 11<sup>th</sup> century, universities were known as "ivory towers" to which very few were admitted. For centuries universities maintained an elitist status, preserving social inequality.

Universities served as institutions for training social and political elites, and created groups with distinct features. This state of affairs, of higher education as hegemony of the elite, began to wane 900 years after the first university opened. The end of World War II symbolized a transition to democratic open institutions of higher education. In most western countries this process occurred at an accelerated rate throughout the twentieth century and led to the massification of baccalaureate degrees. In less than half a century student numbers in the majority of these countries doubled and tripled.

In 1950s' Europe, the percentage of undergraduate students ranged from 3%-5% of their relevant age group. By the late 1990s the figure had climbed to 36%-53%. Today it has topped 60% in most European countries (Lindberg, 2007). In the United States as well a similar trend is evident, with figures reaching nearly 65% of the relevant population (ibid.). Canada (Finnie & Usher, 2007) and Australia have undergone a similar process, and the number of undergraduate students has exceeded 50%. The number of university students (not including the various colleges) reached 41% in Finland and Portugal in 2005. This was the highest rate. Next came England, France, and the US. In England the number of university students reached 34%, in France 33%, and in the US 30% (Usher & Medow, 2010). Israel too has joined this global trend and is part of the global revolution of higher education – in a matter of two decades the number of students has multiplied many times: from 5% in the early 1990s to 53% in 2009 (Central Bureau of Statistics (henceforth: CBS), 2009). In the 2011/12 academic year, 60% of Israeli high school graduates began academic studies (CBS, 2011). In the past two decades higher education has undergone an enormous expansion. In 1990, Israel had 21 schools certified to award academic degrees; these encompassed 88,800 students. By 2011 the number had risen to 66 schools encompassing 297,800 students (ibid.).

Thus, undergraduate studies may certainly be portrayed as a type of "degree for the masses". Admission to undergraduate programs has become widely accessible and most students seeking to attain a baccalaureate degree are able to locate a suitable school for their purposes. The baccalaureate degree, once the lot of a select elite, is today a legacy of the masses (Trow, 2003).

One of the major factors attracting students to the academic world is the perceived potential of accreditation to improve one's status in the labor market and generate financial profit (Ziderman, 1973; Enders, 2010; Furia et al., 2010). Despite this expectation, the actual state of affairs seems to be more complex, due to the rising number of university graduates. For example, a study held on behalf of the Israeli Council of Higher Education (CHE) described the "over qualification" of employees with baccalaureate degrees (Romanov, Tur Sinai & Eisman, 2008; Groot & van den Brink, 2000; MacGuinness & Bennett, 2007). The researchers claim that at least 37% of employees occupy jobs that do not require their current level of schooling. As a result, they earn less than people employed in schooling-compatible jobs. The data also suggest that not all degrees are equal – unspecialized bachelor's degrees increase the risk of not finding a schooling-compatible job. This is particularly evident among graduates of the social sciences, management, general studies, and the humanities.

Since pay is the ultimate motivation for higher education and in light of the data on over-qualification in the labor market, our purpose is to expand the research knowledge on the question of whether higher education has a monetary value and what is this value? Is there a difference between the wage premiums of university graduates from different disciplines? This issue was examined by the Israeli Central Bureau of Statistics (CBS, 2012), which found very large earning disparities between graduates of education and the humanities – whose pay was at the bottom of the scale – and graduates of engineering and computer sciences, whose pay headed the scale. Does schooling guarantee employment in graduates' relevant discipline? In the current study we shall seek to answer these and other questions by examining the pay levels of graduates of the Ariel University Center in various disciplines before, during, and for eight years after graduation.

## **2. ACADEMIC DEGREES AND THE LABOR MARKET**

A baccalaureate degree is a prerequisite for many jobs. In the absence of any other information on candidates, academic degrees provide employers with an evaluation of the quality and potential of prospective employees. According to the theory of human capital, employers use credentials for screening, to predict employee efficiency and productivity (Tyler, 1982; Taubmann & Wales, 1975; Burdett, 2002; Cohn et al., 2002). Credentialism refers to the tendency of students and employers to attribute greater significance to the certificate than

to the skills themselves (Dore, 1976). This process occurs mainly due to employer belief that schooling "improves" workers and that they will be receiving a better return on their money if they employ someone with a more advanced degree. This belief has led employers to demand Bachelor's and Master's degrees of their employees. If employers can employ someone with a graduate degree rather than someone with a non-academic diploma they will prefer university graduates – more educated employees for the same pay.

In the bureaucratic world credentials provide information on one's ability to perform tasks in accordance with required bureaucracy (Brown, 2001). Higher education credentials help distinguish between the capable and the incapable and give employers a means of screening and classifying (Bills, 1998). According to this approach, having an academic degree guarantees knowledge, skills, loyalty, persistence, and other elements beyond professional knowledge (Brown, 2001). According to this explanation, the market demands academic degrees, perceived as essential for evaluating employees' skills although ultimately not required for the job. Thus, it seems that employers have come to consider academic degrees as a measure of competency, a type of employment asset (Bills, 1988).

Employees, from their perspective, believe that degrees increase their opportunity for financial gain, seeing them as a "universal ticket to a desirable career, high pay, and comfortable middle class life" (Wonacott, 2000, p. 1). The research supports this claim, whereby higher education is perceived as a way of attaining financial security and protection against poverty (Enders, 2010). From the point of view of potential employees, the higher their degree the larger the probability of achieving a higher income. This view is the ultimate stimulus for acquiring a higher education. However, in light of the drastic rise in the supply of university graduates in the market, and credentialism practiced by employers – enabling them to employ more educated graduates for less or at least the same pay, the question is whether academic degrees, of any type, indeed generate monetary gain?

### **3. RETURNS ON SCHOOLING**

The subject of returns on higher education has been examined extensively throughout the world. It has been studied recently in Israel as well (see for example Zussman, Forman, Kaplan, & Romanov, 2007; Frish, 2007; Navon, 2004; Klinov, 1980). A recent and fairly detailed survey by the Central Bureau of Statistics was published in 2012 and is mentioned above (CBS, 2012). US research indicates that salary premiums earned by academics are over 40% higher than those of high school graduates (Card & Lemieux, 2001). Data for 2011 show that the multiannual average salary of those with a baccalaureate degree is 74% higher than that of high school graduates. The average salary of employees with graduate degrees is 84% higher than that of high school graduates (Supiano, 2011). Recent data from the social survey of the CBS also show that in Israel – as elsewhere – there is a high correlation between schooling and income. For example, the last survey shows that the monthly income of 56.3% of those with a minimum of 13 years of schooling was NIS 10,001 or more in 2010. In contrast, among those with 11-12 years of schooling only 22.2% reported this level of income (CBS, 2012<sup>a</sup>). This is a difference of over 250%! In Japan massification of higher education was found to lead to a reduced wage premium – and the claim is that this is a consequence of the lower quality of graduates (Hon-Kwong, & Wing, 2005). Salaries affected are mainly those of younger employees and less of more veteran employees. Researchers contend that massification of schooling necessarily leads to an increase in quantity at the expense of quality.

In general, the research literature shows that many variables affect one's level of income and that it is not enough to distinguish between having or not having a degree. For example, Light and Strayer (2004) created an 11-dimension taxonomy indicating causes and reasons of wage disparities within the population of university graduates. Findings indicate that variables such as the type of college from which students graduated, the college where they began their studies (in the case of "transfer students"), the degree (Bachelor's, Master's, PhD) – all have an effect on the wage premium. Thomas and Liang (2005) contend that the quality of the college and the discipline studied are major variables that determine graduates' wage premium. Their research findings show a rise in pay over time in all disciplines aside from life sciences and history. However, there are more significant pay increases in the disciplines of engineering, business management, and mathematics, than in education, where the rise is relatively small. Similar data emerge from the CBS survey published in Israel in 2012 (CBS, 2012). Distinguishing between the sexes, male-favored gender-based salary disparities grow in time. However, ethnic based disparities were relatively small. Similar findings were also found by Black, Smith and Daniel (2005) who found that the quality of the school affects graduates' pay, although they claim that this is true for both women and men.

A study conducted in Australia found that the quality of the school had no significant effect on graduates' initial salaries (Birch, Li & Miller, 2009). Discipline was found to have an intermediate effect on pay. The researchers claim that the identity of students' alma mater holds no significance in the Australian labor market. In Britain as well no significant effect of the school's quality on pay was found one year after graduation (Belfield & Fielding, 2001).

Taniguchi (2005) claims that the wage premium is related to students' age upon graduation. Specifically, her findings show that US students who graduate at the age of 25 and older have a significantly lower wage premium than those who graduate at a younger age. Interestingly, in Israel the CBS survey found the exact opposite: the wage premium is significantly higher among older than among younger graduates (CBS, 2012). Taniguchi also found that the negative impact on pay is more significant for men than for women. She claims that these differences may stem from the fact that women in general tend to gain less from their higher education with the passage of time (Taniguchi, 2005).

Morgan (2008) explored the effect of discipline and gender on wage premium. Findings showed that women, at least in the first year of their career, earn the equivalent of men in professional disciplines such as engineering and the exact sciences. However, the recent CBS survey shows that in Israel the situation is different. Women's pay is significantly lower than men's in all disciplines (CBS, 2012). Some claim that gender equality is only evident in the first year of one's career and in time men take the lead (Wood, Corcoran & Courant, 1993). In other disciplines (social sciences, history, business management, and the humanities) women's salaries were found to be lower than men's. The research claims that these findings show that women are given jobs with lower salaries than men with the same level of skills (Morgan, 2007). There is no consensus in the research literature on the subject of gender effect, and some claim that the wage premium for schooling is higher for women than for men (Goldin, Katz & Kuziemko, 2006), while others claim the opposite (Black et al., 2005; Morgan, 2008; Taniguchi, 2005; Thomas & Liang, 2005; Wood et al., 1993), and yet others contend that there is currently no significant difference between genders (Hubbard, 2011).

Aside from these variables, some have chosen to explore other aspects of baccalaureate degrees and their effect on the wage premium. For example, Hemelt (2010) examined the effect of a double-major versus a single-major degree on one's level of income. Findings show that double-major graduates earn on average a salary that is 3.2% higher than that of their peers in other majors (after controlling for background variables and type of school). The wage premium of double-major degrees changes according to the combination of majors and particularly lucrative combinations include studying a technical or business subject together with a large variety of other subjects.

In one of the most recent studies held in Israel on the returns of higher education, Zussman et al. (2007) examined the difference in returns between graduates of academic colleges and universities, and between different universities. Findings showed that after controlling for socioeconomic data and intellectual skills, the salary of college graduates on their first job is 20%-30% lower than that of university graduates.

Findings also show an extremely high return on higher education in the disciplines of engineering, mathematics, physics, and computer sciences, compatible with very high intellectual skills of students; while in other disciplines salaries for first jobs range from NIS 4,000-6,000 – lower than the national average. In regard to the quality of the school, graduates of academic colleges would have earned 8% more if they had studied at a university due to the level of the school. Examination of earnings over time shows that the monthly wages of university graduates rise over the first three years after graduating by some 20% among both sexes. After controlling for graduate traits, the salary of college graduates was found to rise 5 percent less than that of university graduates. The detailed CBS survey showed that the monthly salary of male university graduates had risen by the third year after their graduation to NIS 15,000, up from NIS 10,248 in their last year of studies. This is a rise of 46.4%. Women's salaries rose over the same period to NIS 8,016, up from 6,150 in their last year of studies. This constitutes a rise of only 30.3% (CBS, 2012, table 1).

We see the current study as a continuation of the research conducted by Zussman et al. (2007) with the purpose of examining differences between the various disciplines within the same school – compared to the former

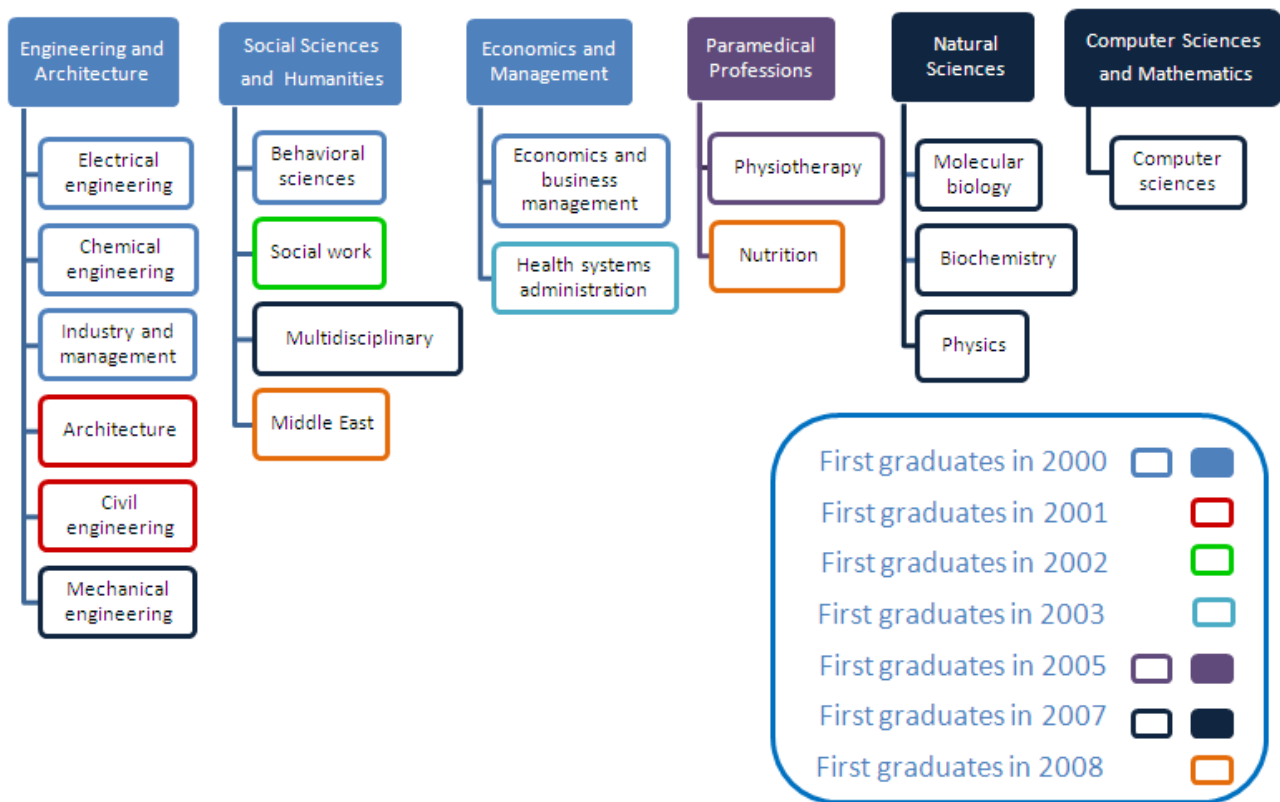
research, where the comparison was between colleges and universities. Analyses are based on employment and salary data of graduates of the Ariel University Center as received from the Central Bureau of Statistics.

**4. METHOD**

**4.1 Participants**

The sample population consists of 6,091 graduates of the Ariel University Center who completed their studies during 2000-2008. Graduates studied engineering and architecture, economics and management, social sciences and the humanities, paramedical professions, natural sciences, and computer sciences and mathematics (see Table 1).

**Table 1. Study fields and departments for 2000-2008**



**4.2 Methodology**

The information sources for the study were:

- A. Michlol – Data on graduates from the Michlol database, the computerized system of the academic administration of the Ariel University Center. This database provides full information on two major criteria:
  1. Graduates' personal data (e.g., sex).
  2. Academic features (faculty, year of graduation, and academic achievements upon graduation).



- B. CBS – Michlol data on graduates were conveyed to the CBS, which was then asked for information on the salaries of those graduates included. The researchers received from the CBS special permission to use its information for purposes of the study. In order to facilitate comparison between the present analysis and formal data published by the CBS in publication 1368 on employment and salaries of bachelor degree graduates, CBS definitions as appearing in the publication were reconstructed for data received from the CBS on Ariel graduates during 2000-2008.

According to CBS publication 1471, the average duration of study for an academic degree at academic colleges is 3.7 years and at universities 3.9 years, therefore we chose the "-4" point as the point of reference for pre-study employment rates and monthly pay.

Notably, average monthly pay was not calculated in CBS publication 1368, and thus the comparison is only with employment rates in similar disciplines to those in the publication. Thus, economics and management at the Ariel University Center was compared with business management in the CBS publication. However no comparison was held for social sciences and the humanities, as the CBS publication presents these disciplines separately with a different range of departments than those at the Ariel University Center.

A considerable part of the analyses presented in this study are shown on a time axis relative to the year of graduation, where, for example -4 denotes "4 years pre-graduation" and 3 denotes "3 years post-graduation". This mode of presentation was selected in order to show trends in employment rates and average monthly pay as a function of seniority on the job over and above the specific year of graduation.

#### **4.3 Definitions**

- Rate of employment – The percentage of graduates in a certain year whose income was reported to the tax authorities in a single calendar year, weighted by the number of work months in that calendar year. For example, a person reported to have worked 6 months at a certain job during a calendar year will have an employment rate of 0.5. For each cell, the figure presented is the average for each employee for that calendar year. Since the Israeli tax authority's files include all official employment data, anyone not appearing in these files is assumed to be outside the workforce for the relevant calendar year.
- Income from work – Total gross income from work for the calendar year (i.e. before deducting mandatory payments) per person. I.e. income received from several jobs for the same person and/or from self-employed work, is calculated in total.
- Average monthly pay – Total annual income divided by months employed in a certain year.

#### **5. GENERAL FINDINGS**

The general findings focus on employment rate and average monthly pay of graduates.

##### **5.1 Average wage and rate of graduate's employment over time**

During 2000-2005 most graduates studied the disciplines of engineering and architecture. In 2000-2002 over 80% of graduates studied these disciplines. The percentage of graduates who studied economics and management rose gradually from 9% of all graduates in 2000 to 46% of graduates in 2007 (in 2008 there was a slight drop to 39%). The percentage of graduates in the humanities and social sciences during 2002-2005 fluctuated and ranged from 12% to 18%. As of 2005 a steady rise is evident, from 15% to 25% in 2008.

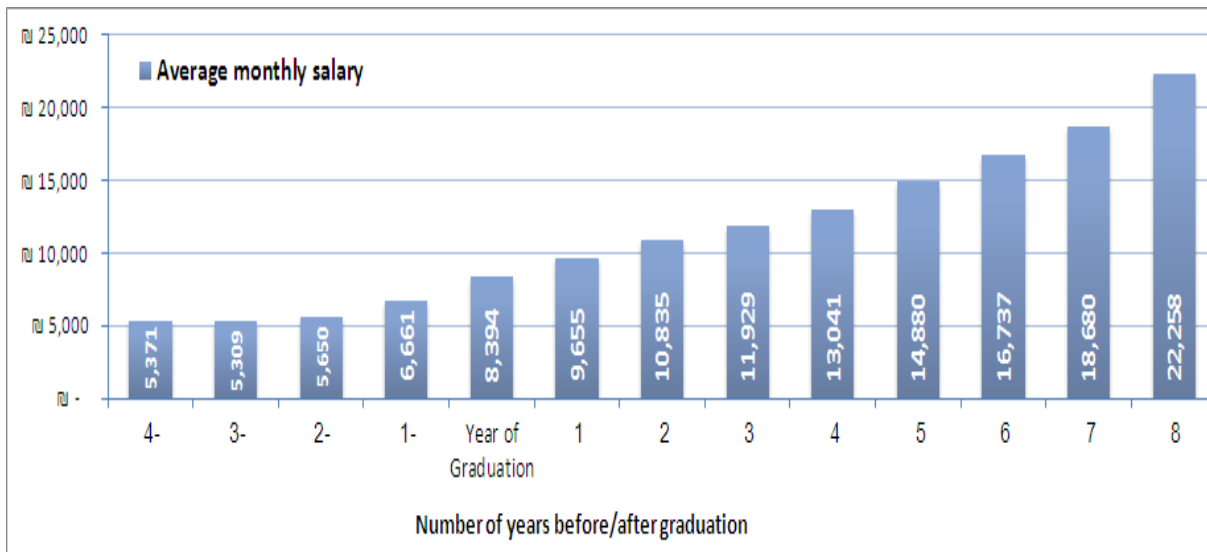


Figure 1: Average monthly wages of all graduates by number of years pre/post-graduation

The findings show that **two major factors have an effect on average monthly pay: year of graduation and job seniority.**

The rise in average monthly pay begins in the last year of school (point -1 on the time axis in figure 1). Seniority has a clear effect on average monthly pay. However, notice that in the first four classes examined (5-8 years of seniority on the time axis in figure 1) between 70% and 90% of graduates studied engineering and thus their average monthly pay has an upward bias and does not reflect the expected average monthly pay of all graduates for the classes of 2007-2008 once they accumulate similar seniority on the job.

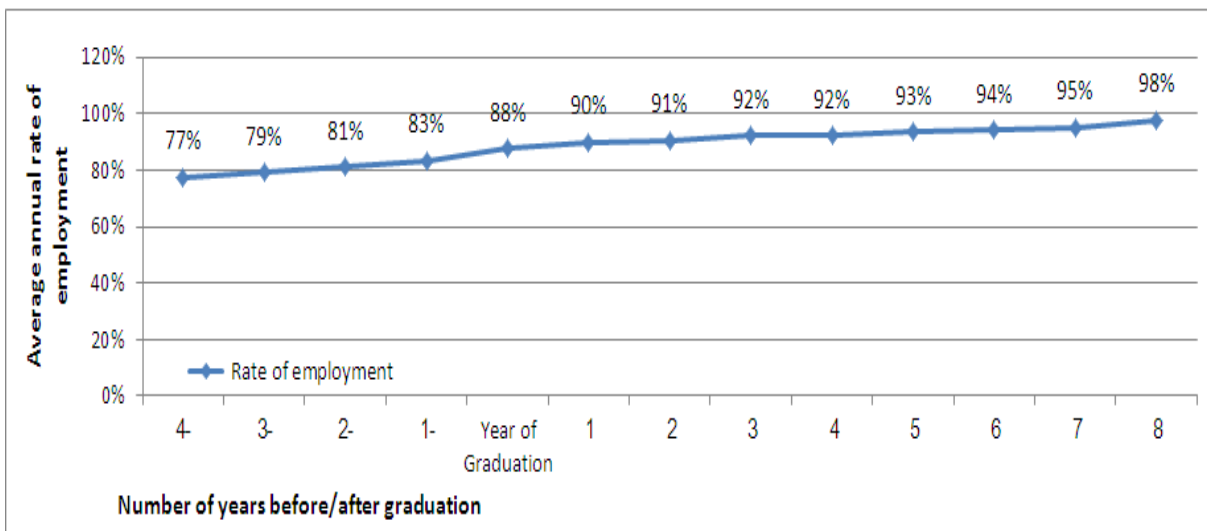


Figure 2: Average employment rate of all graduates by number of years pre/post-graduation

As expected, **graduation is the major determinant of rate of employment.** However, there is a constant rise in rate of employment when students are still at school: from 77% four years before graduation to 83% one year before graduation. The rate of employment stabilizes about one year post-graduation, reaching 90-92% of all graduates.

Notably, in the first four classes (subjects with 5-8 years of seniority on the time axis in figure 2) between 70% and 90% of graduates studied engineering. This discipline is in high demand in the Israeli economy and thus the higher employment rates (93-98%) are not necessarily characteristic of all graduates of the classes of 2007-2008 once they accumulate similar seniority.

## 5.2 Distribution of graduates by discipline over time

In this section the rate of employment and average monthly pay of graduates is presented by discipline in the last year of school and after accumulating seniority on the job.

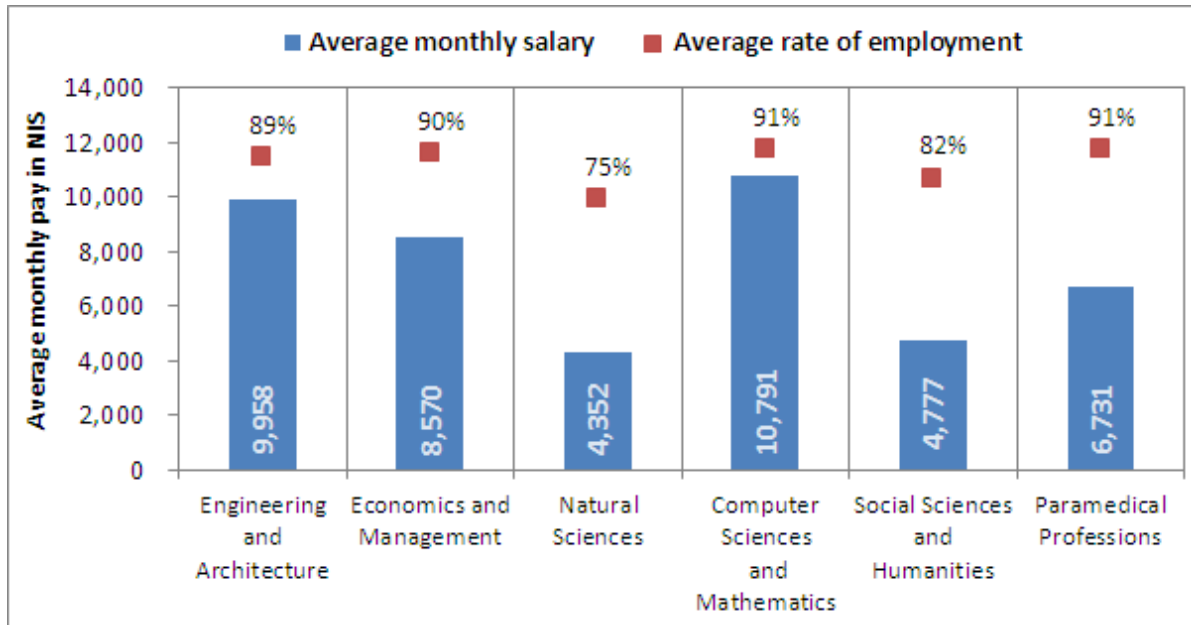


Figure 3: Rate of employment and average monthly pay of graduates by discipline in the last year of school

In the last year of school high rates of employment are observed in most disciplines, about 90%. Lower rates were found among graduates of natural sciences (75%) and of social sciences and the humanities (82%). In the discipline of computers and mathematics and in the discipline of engineering and architecture high average monthly pay was observed for the last year of school (NIS 10,000 – NIS 11,000). In the natural sciences and in the social sciences and the humanities graduates' pay is relatively low in the last year of school. In the natural sciences the data refers to the classes of 2007-2008, when the national minimum wage for 2008 was NIS 3,850.

### 5.2.1 Graduates' rate of employment and wages by discipline over time

In the three longtime disciplines of engineering and architecture, economics and management, and social sciences and the humanities, there are no significant differences in rate of employment between the third and fifth year post-graduation. Average monthly wages rise with seniority in all disciplines but at a different rate. For example in engineering and architecture the rate of increase is about 13%-15% per year of seniority when compared to wages in the last year of school. In contrast, in economics and management, in the first three years post-graduation each year of seniority adds about 4.5% to the average monthly wages while in the fourth and fifth year they add about 12%-13% each.



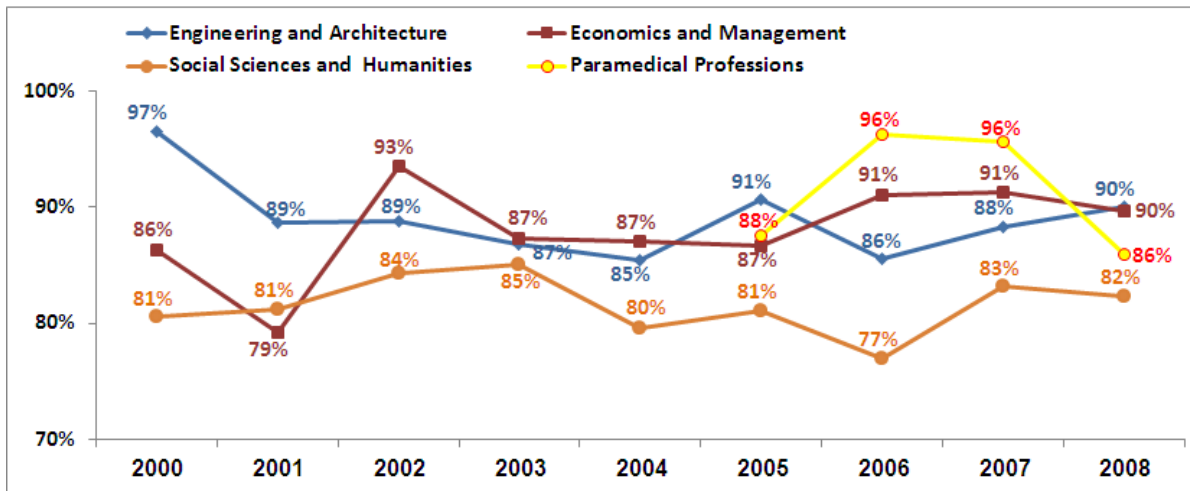


Figure 4: Rate of employment in the last year of school by discipline for the classes of 2000-2008

In engineering and architecture very high rates of employment (97%) were found among the graduates of 2000. In subsequent years these rates dropped and despite several fluctuations never exceeded 91%. In economics and management the first three classes (2000-2002) were very small (10-28 graduates) and therefore no significance should be attributed to the large data fluctuations for these classes. Beginning from the class of 2003 the figures stabilize and a rise can be discerned, from 87% employment during 2003-2005 to 90%-91% employment in the last year of school in 2006-2008. In the humanities and social sciences there is a slight fluctuation in the employment rates of graduates in the last year of school, with a range of 81% to 85%. In the paramedical professions, in the classes of 2006-2007 the employment rate upon graduation was particularly high, reaching 96%. A possible explanation of the drop in the employment rate of the class of 2008 is that one third of the graduates studied nutrition rather than only physiotherapy, as in the first three classes. In the natural sciences, mathematics, and computer sciences there were only two classes until 2008 and therefore they are not presented.

5.2.2 Employment rate and wages three years post-graduation by discipline

Figure 5 showing employment rates indicates stability between classes in employment rates three years post-graduation – both in engineering and architecture and in economics and management. In the social sciences and the humanities figure 5 shows more fluctuation, with differences of up to 10% in employment rates between classes.

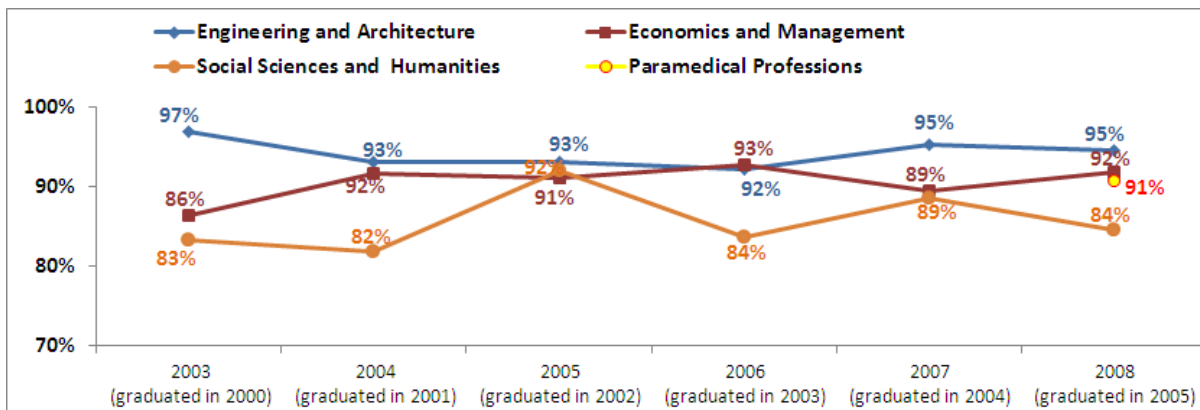


Figure 5: Employment rate three years post-graduation

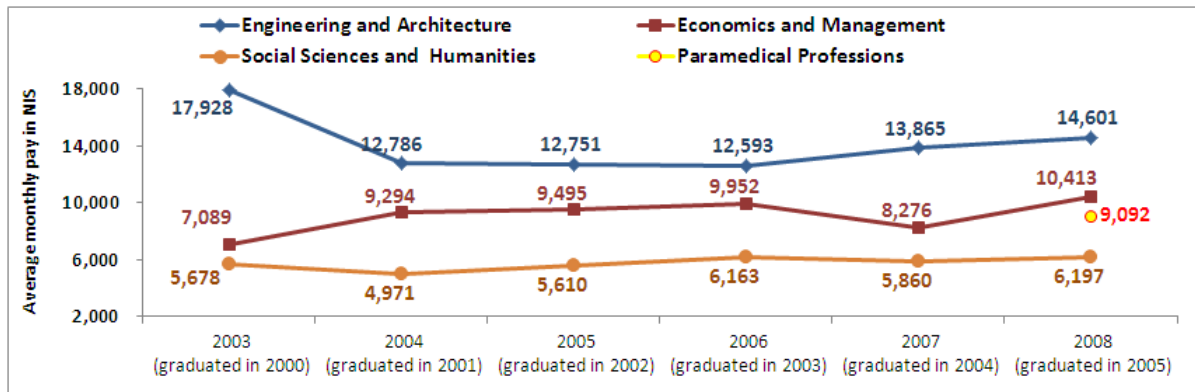


Figure 6: Average pay three years post-graduation

Figure 6, showing average monthly pay three years post-graduation, reflects relative stability in the three longtime disciplines, aside from the transition from 2003 to 2004. In engineering and architecture a process of decline can be seen, followed by a rise from 2003 to 2008. This process is evident in both measures: in employment rates – a drop from 97% in 2003 to 92% in 2006 and back to 95% in 2008; in average monthly wages – about 18,000 in 2003, a drop to 12,600 in 2006, and a rise to 14,600 in 2008.

5.2.3 Graduates' rate of employment and wages by discipline and by number of years pre/post-graduation

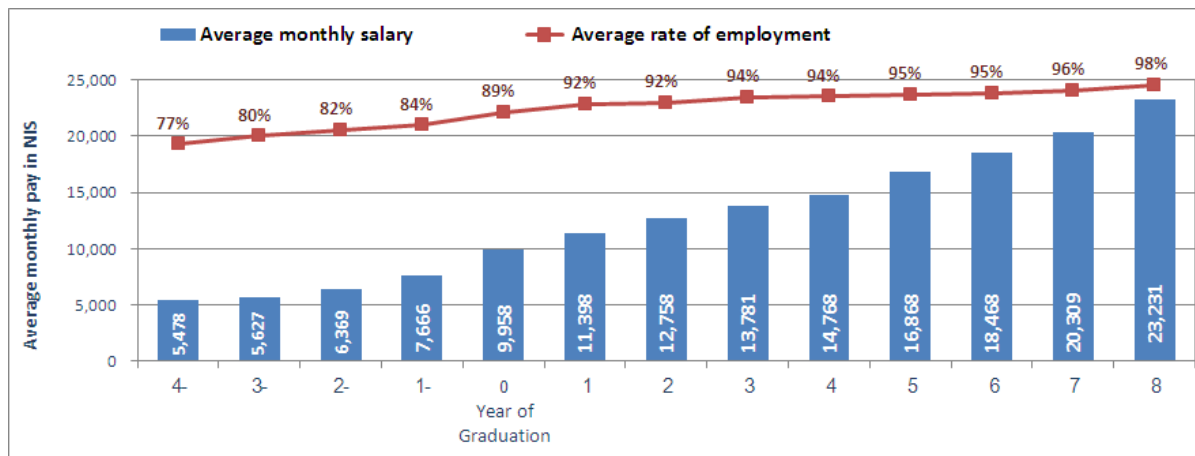


Figure 7: Engineering and architecture – employment rate and average monthly pay by number of years pre/post-graduation

The employment rate and average monthly pay in engineering and architecture are higher than in all other disciplines. The employment rate rises from 89% in the last year of school to 94% three years post-graduation. Notably, the discipline of engineering and architecture encompassed different departments in different years. Thus, those with 8 years of seniority are mainly electrical engineers (76%), explaining the particularly high employment rates and monthly salary of this group.

In Israeli public colleges the employment rate in engineering and architecture in the last year of school ranges from 73% to 81%, in private colleges from 85% to 90%, and in universities from 85% to 88%.

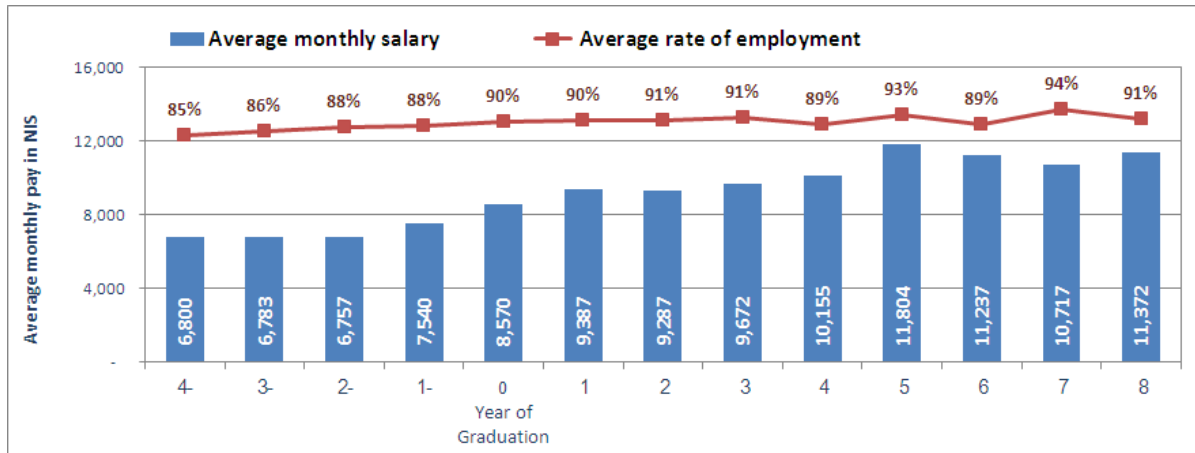


Figure 8: Economics and management – employment rate and average monthly pay by number of years pre/post-graduation

The high employment rate and relatively high monthly salary even prior to beginning academic studies (85% employment, NIS 6,800 a month in year -4) suggest that some of the students in this discipline are developing an existing career rather than acquiring a new profession. Graduation raises the employment rate to 90% and the average monthly pay to NIS 8,570. Employment rates stabilize upon graduation at about 90% of all graduates. Average monthly pay increases with seniority at a relatively moderate rate.

In the first three classes (seniority of 6-8 years on the time axis of figure 8), the number of graduates in economics and management was low and totaled less than 30 and therefore the data fluctuations for these classes are insignificant. In all public and private colleges in Israel, the employment rate in business management in the last year of school ranges from 83% to 88% and in universities from 86% to 90%.

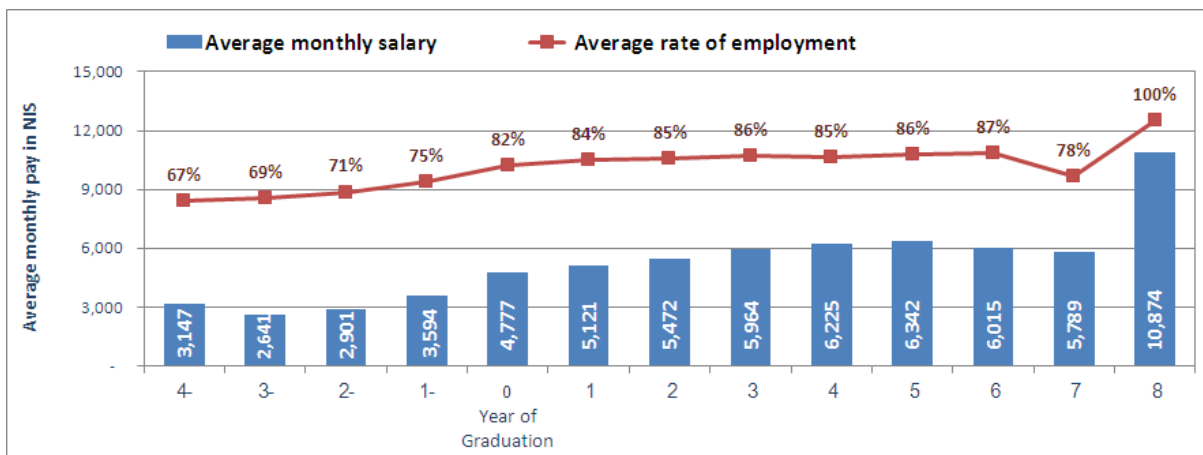
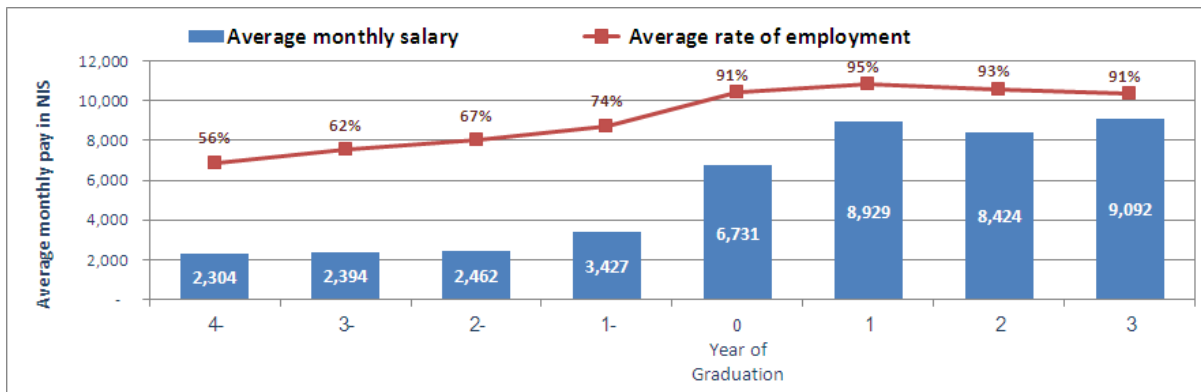


Figure 9: Social sciences and the humanities – employment rate and average monthly pay by number of years pre/post-graduation

Before commencing their studies, about two thirds of the graduates were employed at an average salary of NIS 3,150. The employment rate rose moderately and at the last year of school it reached 82% with an average salary of about NIS 4,800 (about NIS 1,200 more than the year before graduation). One year post-graduation the employment rate stabilized at 84-86% of all graduates. The average monthly pay rose slightly with seniority and in three years stabilized at about NIS 6,000. Notably, in the first two classes (7-8 years of seniority on the time axis of figure 9) the number of graduates who studied social sciences and the humanities was particularly low, with a total of less than 20, and therefore the data fluctuations for these classes are insignificant.

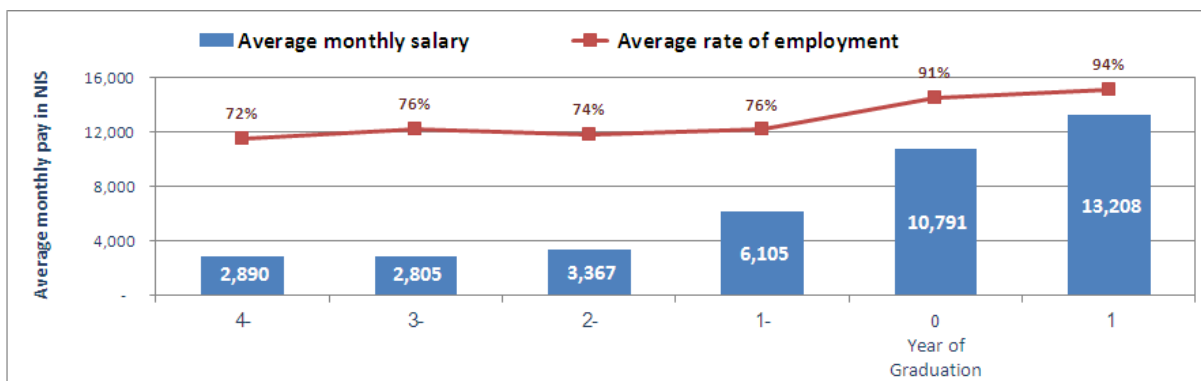


**Figure 10: Paramedical professions – employment rate and average monthly pay by number of years pre/post-graduation**

Figure 10 shows that in the paramedical professions graduation is the most influential factor for employment rate, although there is a moderate consistent rise in employment rate during the years of study, from 56% four years pre-graduation to 74% one year pre-graduation. The employment rate rises sharply to 91% upon graduation and reaches 95% one year post-graduation.

In addition, the figure shows a sharp rise in average monthly pay after only one year of seniority – a rise of NIS 2,000 compared to the average monthly pay in the last year of school and of nearly NIS 5,500 compared to the salary earned one year pre-graduation.

In the two first classes (2-3 years of seniority on the time axis in figure 10), the number of graduates in the field of paramedical professions was low and therefore no significance may be attributed to data fluctuations for these classes.



**Figure 11: Computer sciences and mathematics – employment rate and average monthly pay by number of years pre/post-graduation**

Graduation seems to have a significant effect both on the employment rate and on the average monthly pay. While at school the employment rate remains stable, between 71%-76% and at the last year of school it rises to 91%. A significant rise in average pay is evident as early as one year pre-graduation, from a salary of about NIS 3,000 when beginning one's studies to a salary of about NIS 6,100 one year pre-graduation. Upon graduation monthly pay rises significantly and reaches about NIS 10,800, further rising to NIS 13,200 at one year of seniority. Notably, in the two classes that graduated to date there was a particularly low number of graduates in the computer sciences and no conclusions may be reached from them about the expected rate of employment and pay of graduates of subsequent classes.

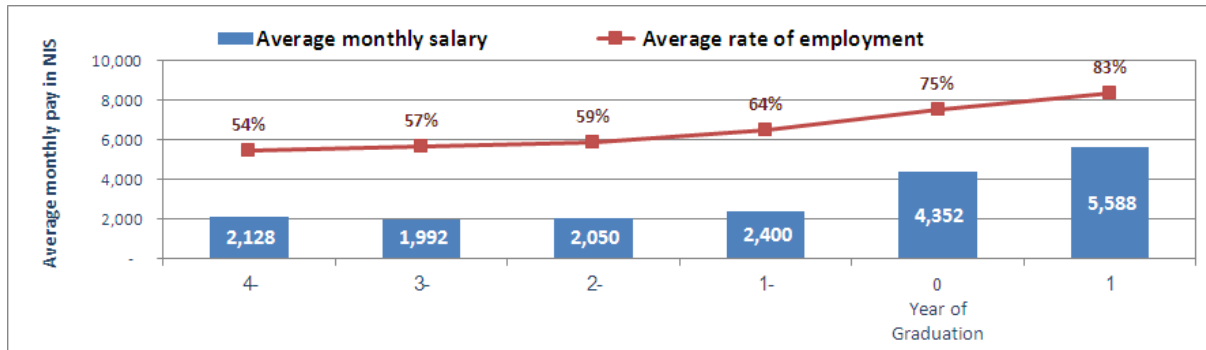


Figure 12: Natural sciences – employment rate and average monthly pay by number of years pre/post-graduation

In this discipline, the rate of employment upon graduation is the lowest, reaching only 75% in the last year of school, with a rise to 83% the next year. The average monthly pay is low as well: despite a rise of NIS 2,000 from one year pre-graduation, in the last year of school the average monthly pay reached only NIS 4,400. Notably, the number of graduates in the two classes that graduated with a degree in the natural sciences to date was low, and therefore the data presented here and conclusions reached should be treated with caution.

The employment rate in the natural sciences among university graduates in Israel in the last year of school ranges from 74% to 77%. There are insufficient data on graduates of private or public colleges in this field.

### 5.3 Graduate employment data by gender by discipline over time

Distribution of graduates by sex shows a constant proportion of female graduates (two thirds of the entire class) and male graduates in each class.

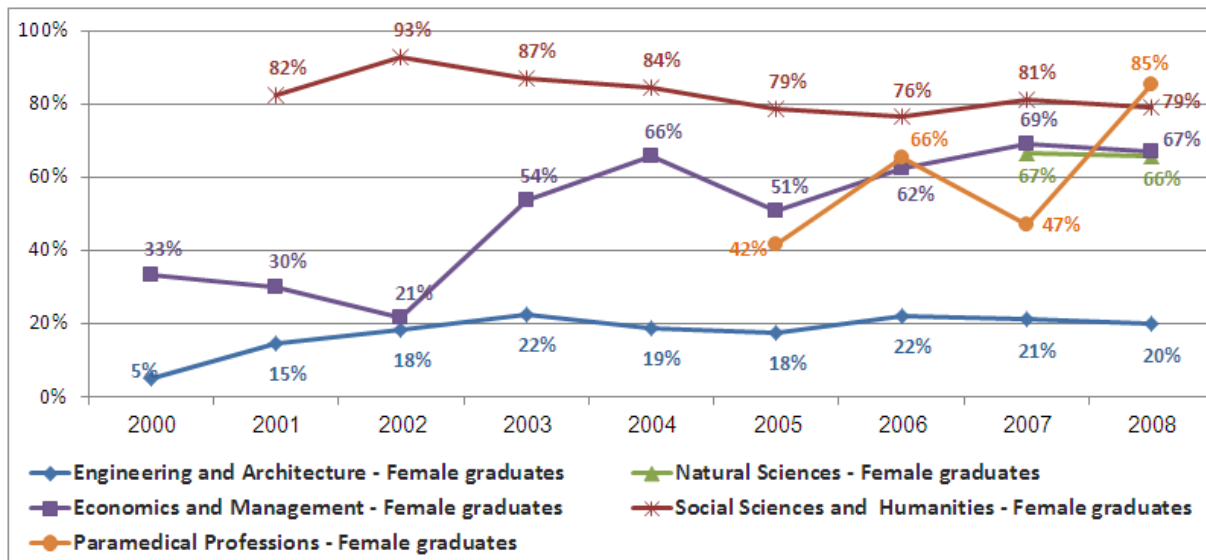


Figure 13: Proportion of female graduates in each class by discipline

From 2002 the proportion of female graduates in engineering and architecture stabilized at about 18%-22% (previously it was even lower, in 2000 only 5%). Between 2001 and 2004 the proportion of female graduates in the social sciences and the humanities ranged from 82%-93%. In 2005-2008 this proportion dropped and ranged from 76%-81%.

With the development of the discipline of economics and management, from 2003 on, women constituted over half the graduates in this discipline. After fluctuations, from 2006 the proportion of female graduates stabilized at about two thirds of all graduates in this discipline. In the paramedical professions there is a mixed rise in the proportion of female graduates, from 42% in the first class (2005) to 85% in the class of 2008.

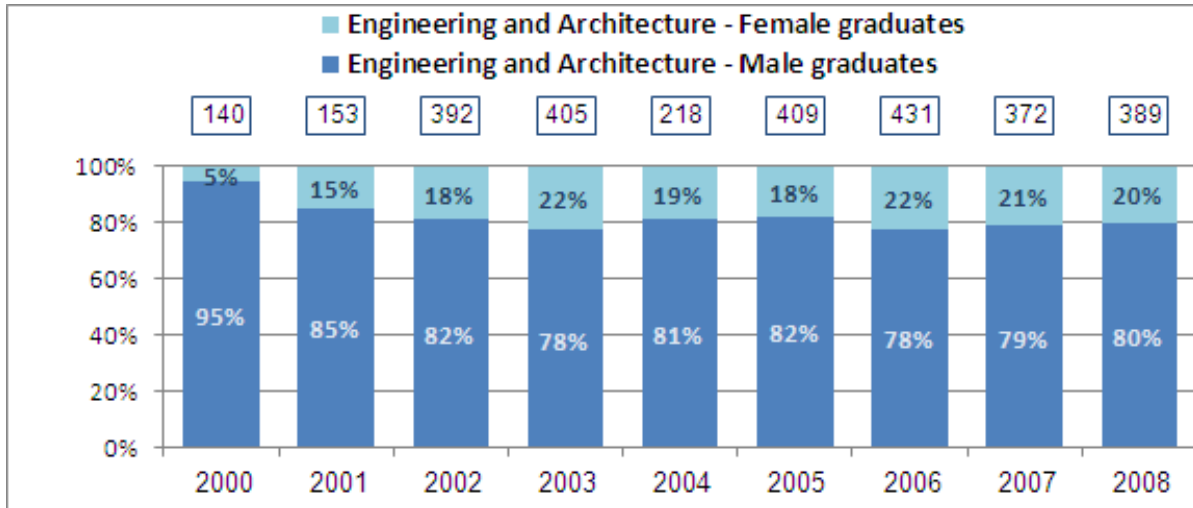


Figure 14: Proportion of male and female graduates in engineering and architecture

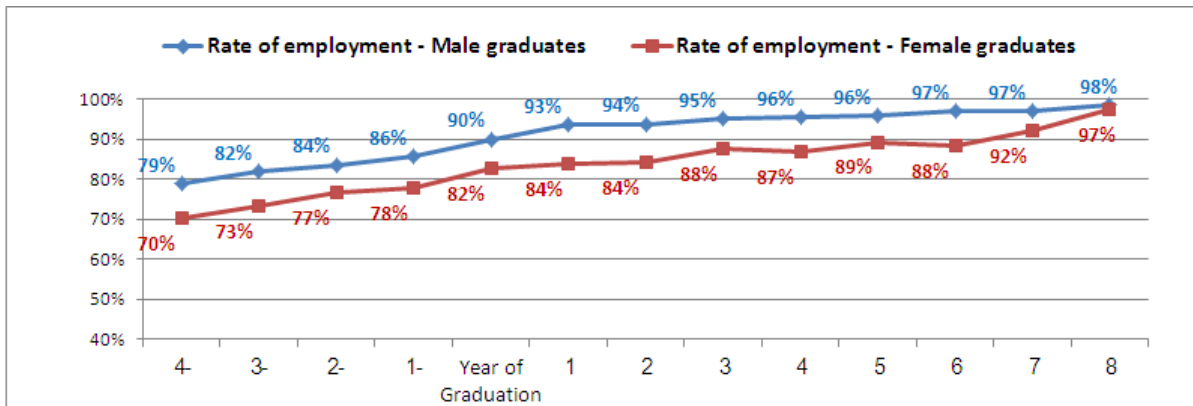


Figure 15: Rate of employment of male and female graduates in engineering and architecture

In engineering and architecture a constant difference of about 10% is observed in the rate of employment of male and female graduates, from the beginning of academic studies through graduation and until six years post-graduation. Notably, in the first two classes (7-8 years of seniority on the time axis of figure 15), the number of female graduates was low, and therefore the reduced disparity in employment rates evident in figure 15 at these points is insignificant. In figure 14 showing distributions of graduates by sex, since 2002 the proportion of female graduates seems stable.



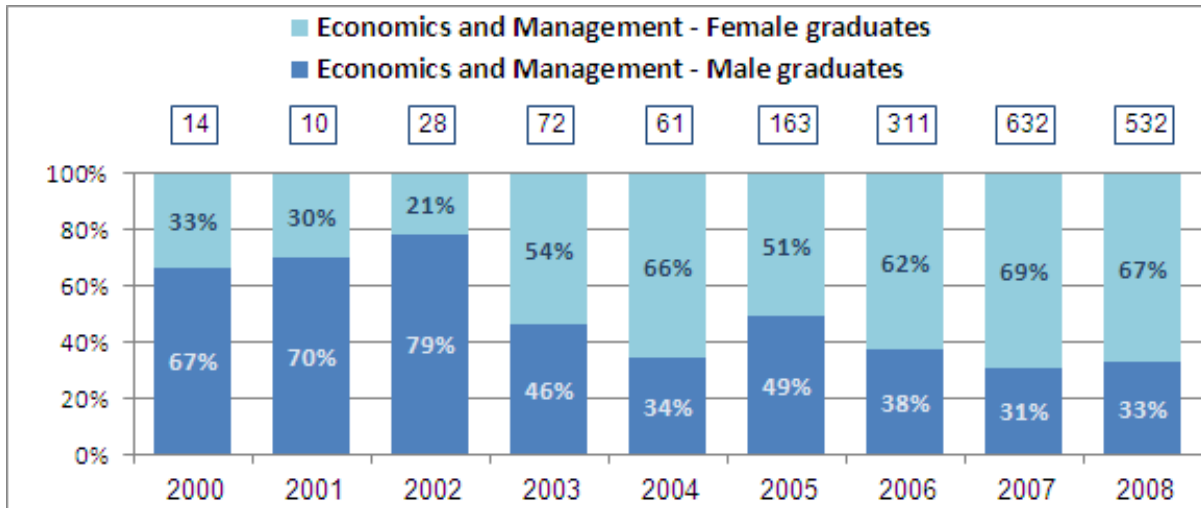


Figure 16: Proportion of male and female graduates in economics and management

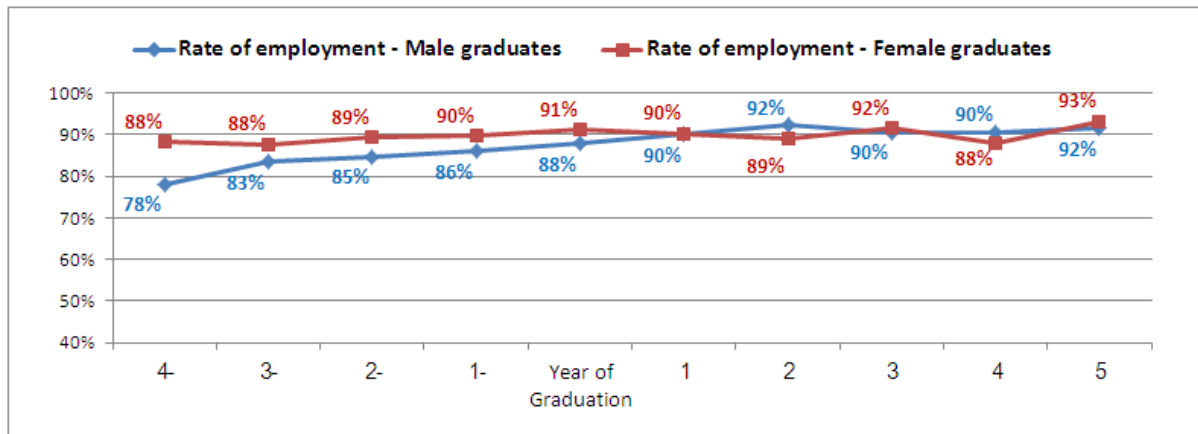


Figure 17: Rate of employment of male and female graduates in economics and management

In economics and management, a difference of 10% in the employment rates of female and male graduates before beginning their studies is evident (point -4 in the figure above) but this difference gradually disappears towards the end of their studies. From graduation to 5 years of seniority there are no significant differences in the employment rates of male and female graduates: the rate of employment is about 90% in both groups.

In the first three classes (2000-2002), the number of graduates was small, and therefore differences in employment rates by sex were not analyzed for these classes.

In the distribution of graduates by sex it is evident that female graduates constitute one half to two thirds of every class – side by side with a significant increase in the total number of graduates in each class.

In the field of social sciences and the humanities a difference of 12% in the employment rate of male and female graduates was observed before beginning their studies (point -4 in the figure) but this difference is gradually reduced to only 3% in the last year of studies.

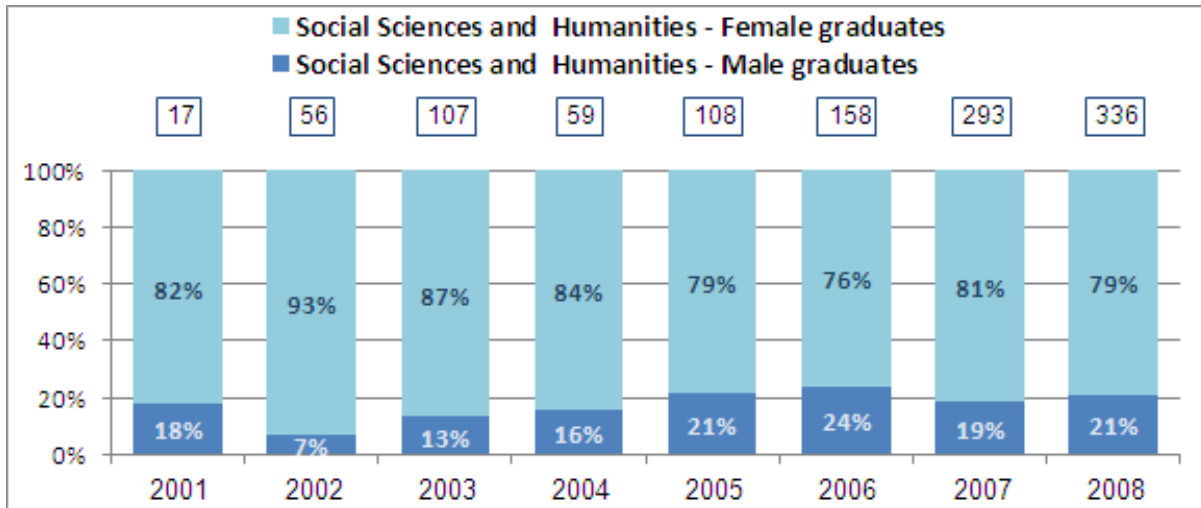


Figure 18: Proportion of male and female graduates and rate of employment in the social sciences and the humanities

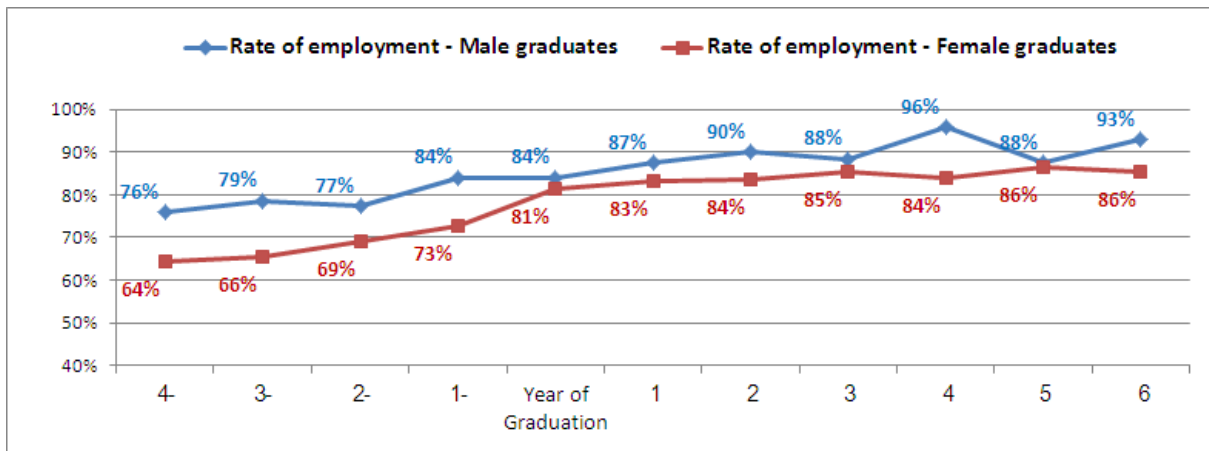


Figure 19: Rate of employment of male and female graduates in the social sciences and the humanities

The employment rate of female graduates stabilizes at about 85% at two years post-graduation. The employment rate of male graduates is more volatile and ranges from 88% to 96% over this period, but is always higher than that of female graduates. Figure 16 shows a constant proportion of female graduates (around 80%) side by side with a significant rise in the total number of graduates in each class.

In the natural sciences, before beginning studies a large difference of about 16% was observed in the employment rate of female and male graduates (point -4 in figure 20). This difference gradually diminishes during the years of study and is reversed one year pre-graduation, when the employment rate of male graduates exceeds that of female graduates.

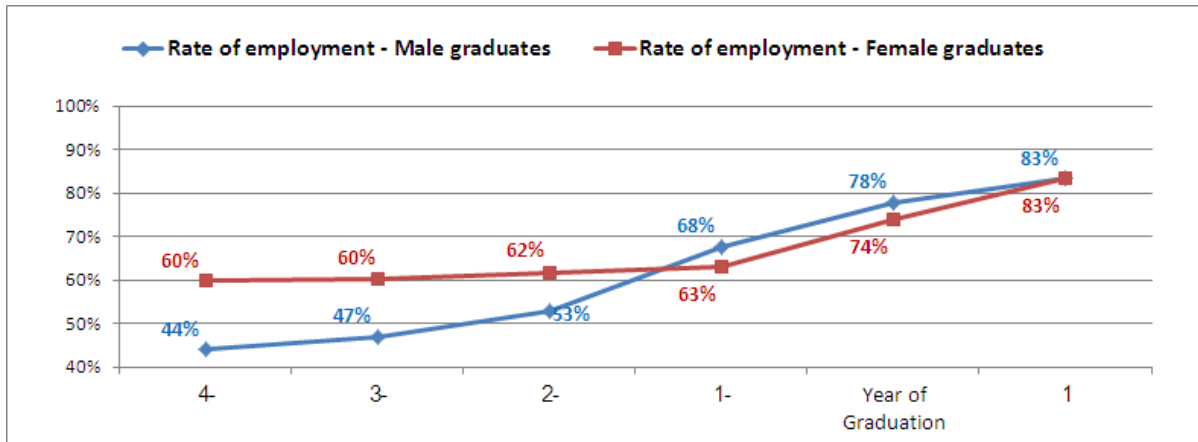


Figure 20: Rate of employment of male and female graduates in the natural sciences

Graduation is undoubtedly the dominant cause of the rise in employment rates – both among male and female graduates. In each group a rise of about 10% in employment was observed in the year of graduation versus the next to last year of school (point -1 in figure 20). In addition, one year of seniority adds to the rise in employment rates and brings both groups to 83% employment.

Figure 21 depicting distribution of graduates by sex shows a constant proportion of female graduates (two thirds of the entire class, of about 30 students).

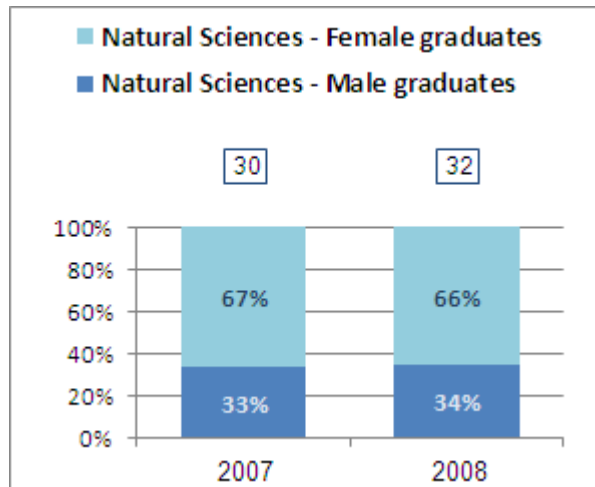


Figure 21: Proportion of male and female graduates in the natural sciences

The paramedical professions consisted only of the department of physiotherapy until the class of 2008, when a department of nutrition was added. This fact explains the sharp rise in the proportion of female graduates in this discipline: from 47% in the class of 2007 to 85% in the class of 2008 (figure 23).

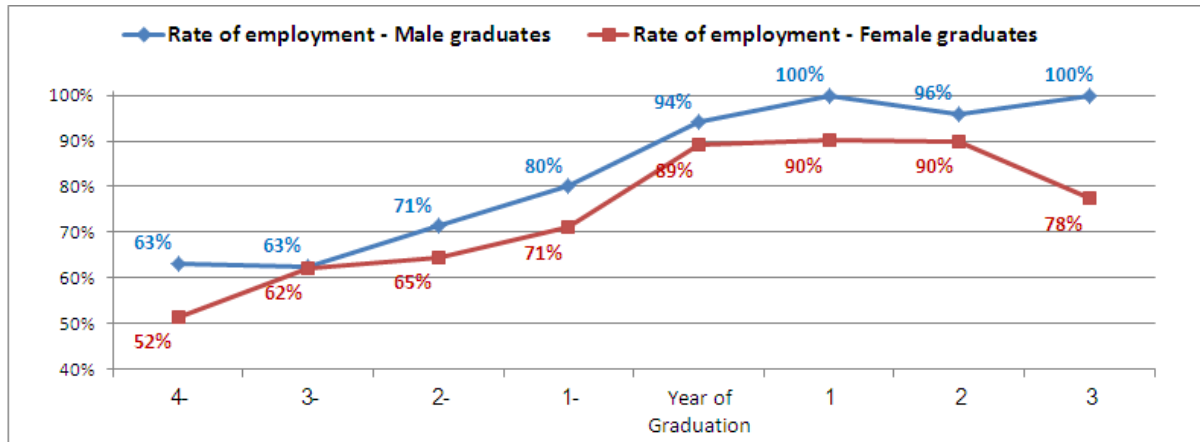


Figure 22: Employment rate of male and female graduates in the paramedical professions

In the paramedical professions a difference of about 5% to 10% in the employment rate of male and female graduates was observed – from before beginning their studies (point -4 in the figure) through graduation and until two years of seniority on the job.

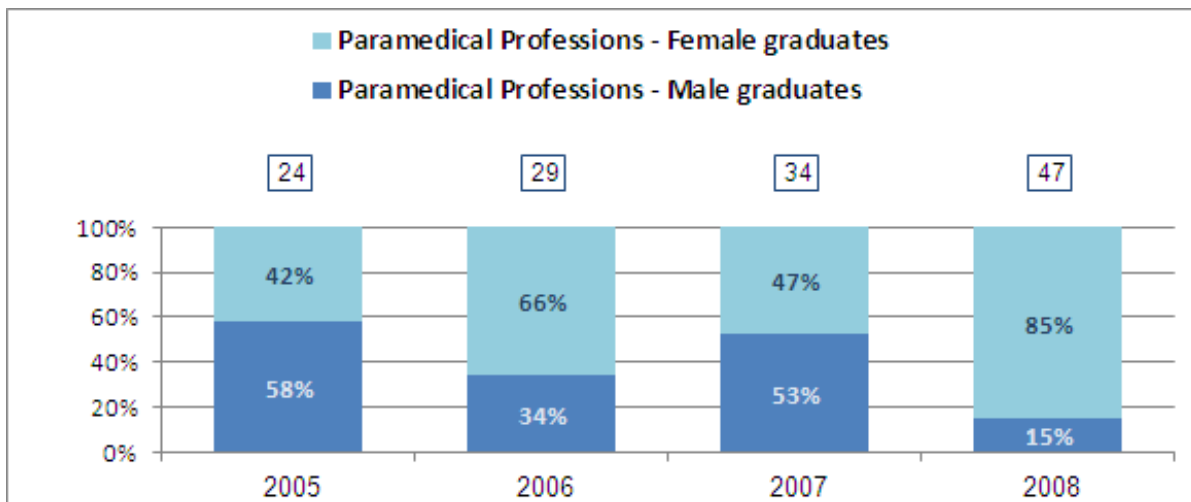


Figure 23: Proportion of male and female graduates in the paramedical professions

In the first class (those with three years of seniority in figure 22) the number of female graduates was relatively low and thus no significance should be attributed to the irregular values at this point.

## 5.4 Summary of findings

### 5.4.1 Employment rates of graduates

- In the last year of college and subsequently the proportion of graduates employed rises to about 90% versus 77% before beginning their studies.
- The employment rate of graduates in the different disciplines is not uniform: In the last year of school about 90% of graduates of engineering and architecture, economics and management, paramedical professions, and mathematics and computer sciences, are employed, versus 75% in the natural sciences and 82% in the social sciences and the humanities. Similar discrepancies are evident several years post-graduation as well.

- The proportion of those employed before beginning their studies and during the years of study is highest in economics and management (85%-88%), followed by engineering and architecture and computer sciences and mathematics (72%-84%). The lowest proportions are in the natural sciences (54%-64%) and paramedical professions (56%-74%).
- The employment rate of male graduates post-graduation is higher than that of female graduates in all disciplines aside from economics and management and natural sciences (where the proportions are equal). In engineering and architecture the discrepancy is about 10% and in the social sciences and the humanities about 5%.
- When comparing between classes three years after graduation, the proportion of graduates of engineering and architecture and economics and management who were employed remained constant, the proportion of those employed among graduates of social sciences and the humanities is less constant, and discrepancies of 5% to 9% may be found between the different classes.

#### *5.4.2 Average monthly wages*

- In the last year of school graduates' average monthly pay was NIS 8,394 – a rise of 56% versus the average wage before beginning their studies. Three years post-graduation the average wage of graduates reached NIS 11,929 – a rise of 42% versus their wages in the last year of school and a rise of 120% versus their wages before beginning academic studies.
- Average monthly pay in the last year of school differs greatly between disciplines and ranges from about NIS 4,500 in the natural sciences and social sciences and the humanities to about NIS 10,000 in computer sciences and mathematics and in engineering and architecture.
- Wage discrepancies between disciplines increase with seniority as well. In engineering and architecture, five years post-graduation, graduates' pay rises by 69% versus their last year of school, while in the social sciences and the humanities graduates' pay rises by only 33%.
- When comparing between classes, three years post-graduation wages remain stable within all longtime disciplines (engineering and architecture, economics and management, and social sciences and the humanities).
- There are significant differences between the disciplines in wages before and during academic studies: before beginning studies the average monthly pay of students of economics and management is NIS 6,800 versus only NIS 2,100 – NIS 2,300 in the natural sciences and paramedical professions. This fact implies a crucial difference in the stage of life at which students commence their studies in the various disciplines.

## **6. DISCUSSION**

Higher education has always been associated with myriad benefits: high social status, belonging to a cultural elite, a higher income, and in general, a better future. Until the mid-20<sup>th</sup> century these benefits were inaccessible to a majority of the population and only a small proportion could enter what was perceived as an ivory tower. The few who managed to enter knew that their education would become an asset. In certain periods, while education was not necessarily an economic advantage it was a status symbol and a value in and of itself. With the rise of capitalism and the general shift in the ideology of the western world, education became an economic tool as well – a way of promising oneself a comfortable and pleasurable life (Wonacott, 2000).

At a time when the academic world was not open to the masses, the few who entered could indeed be predicted to number among the higher social classes from a financial perspective as well. However over the past few decades the academic world has undergone many transformations, of which the most significant is wide accessibility – massification of the baccalaureate degree. Today most students can find a school in which they will attain a higher education. The consequence is an inflation of baccalaureate degrees. In the current study we attempted to explore this inflation through the major objective of many students – improving their financial situation.

Analysis of the data as a whole shows that in terms of wages and employment rates university graduates are doing very well. In less than ten years they reach salaries amounting to nearly three times the average national salary

(and five times the median salary) and an employment rate of almost 100%. From this general perspective academic degrees definitely seem worthwhile. However a closer look reveals a more complex state of affairs.

## **6.1 Disciplines**

Selecting an academic discipline is the most crucial determinant of one's income as well as of one's chances of employment. The findings indicate that the most "profitable" fields are computer sciences, mathematics, engineering, and architecture. In contrast, wages in the natural sciences, social sciences, and the humanities, are significantly lower both than the former and than the national average salary, at least for the first eight years. The discrepancy between the different disciplines remains valid even after acquiring seniority on the job. These findings show that even necessary and socially important professions such as nursing, social work, and psychology, receive less public appreciation – as manifested in salary levels. In contrast, the engineering and architecture professions receive almost immediate recognition in financial terms. One possible explanation is the discrepancy between public funding and private funding – most of the social professions are funded by public organizations, while the engineering and architecture professions are primarily managed by private firms. The private market is more profitable than the public market and the first to feel the consequences are government employed academics. These findings are compatible with those of Zussman et al. (2007) who indicated significant discrepancies between the scientific professions and others.

## **6.2 Gender**

One's sex is another significant variable affecting salary levels as well as employment rates. In Israel as elsewhere (Black et al., 2005; Morgan, 2008; Taniguchi, 2005) there are gender discrepancies within the labor market. These are initially evident in the tendency to engage in certain disciplines and to choose fields traditionally considered "feminine", such as social sciences and the humanities – in which women constitute over three quarters of all graduates. In contrast, in professions considered "masculine", such as engineering and architecture, women constitute one fifth of all graduates. By choosing these fields, women (as well as men) dictate their own future course of earnings, as social sciences and the humanities are not the most profitable fields, as shown above.

Thus due to the fundamental differences in women's representation in the profitable fields, there is an integral discrepancy between the sexes in their level of income. This discrepancy is a result not only of inequality between the sexes but also of the public attitude towards social disciplines, which lack financial appreciation.

In addition to the inherent discrepancy deriving from selection of a certain track, gender per se constitutes a determinant of male-female disparity as well. This is evident in the disparate employment rate, which is 12% higher among men. The different rates of employment, despite their changing magnitudes, exist also within each discipline when comparing men and women post-graduation. Although the current study did not examine differences in salary levels between men and women, most studies conducted show that in the majority of western countries there is some discrepancy in favor of men (Black et al., 2005; Morgan, 2008; Taniguchi, 2005; Thomas & Liang, 2005; Wood et al., 1993). The most recent multi-year CBS study clearly indicates large consistent salary discrepancies between male and female graduates of the various disciplines (CBS, 2012, table 1). This discrepancy, when considered together with those in rates of employment and inherent discrepancies between professions in which women occupy a disproportionately low place, reveal a bleak social state of affairs and a situation of intrinsic inequality.

## **7. CONCLUSION**

Today, when education has become a mass commodity, it seems that an academic degree in and of itself is not enough to guarantee financial or employment security. Employees in the fields of social sciences and the humanities might find themselves earning salaries that equal those of the uneducated. One of the implications, which is already in evidence, is the attempt to earn a higher degree on the assumption that it might improve one's financial situation. The equation more schooling = more money seems to include other components as well, such as the discipline studied, one's seniority, and the market to which the employee belongs. Students who choose a course of study are in fact choosing their earning capacity. While improving general access to higher education has provided large parts of society with a wide range of opportunities, it has also detracted from the prestige of the professions



studied and discredited them. This state of affairs makes it possible for employers to pay less and receive more. We believe that the salary gaps between the professions reflect society's appreciation and valuation of certain fields, while others are taken for granted. A forward-looking society must reinforce and reward professions that form the core of its existence – educators, caregivers, authors, and philosophers. As things stand now, the message conveyed is that some disciplines are worth much more than others.

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