The Return to Practical Engineering Studies in Israel Under MAHAT Supervision

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Abstract

Background

The Government Institute for Training in Technology and Science (MAHAT), operating under the Ministry of Labor, is the central public body responsible for Israel's post-secondary technological education system. Each year, approximately 10,000 practical engineers graduate from colleges funded and supervised by MAHAT. Given the scale and strategic importance of MAHAT's activities, several government committees and subsequent government resolutions have called for a comprehensive assessment of labor market returns to its study tracks to support evidence-informed policymaking and strengthen Israel's technological education system.

In response, this study – conducted jointly by the Myers-JDC-Brookdale Institute and the Ministry of Labor's Strategy and Policy Planning Division – provides the first comprehensive assessment of labor market returns to MAHAT-supervised studies, based on nationwide administrative data. The findings are intended to support prospective students in making informed educational choices, assist policymakers in prioritizing fields of study that generate higher returns, and inform decisions regarding curriculum development, resource allocation, and continued funding and supervision of fields that generate limited returns.

Study Objectives

Estimate the wage returns to MAHAT-certified practical engineering studies relative to upper secondary education only, by field of study and years from graduation, and examine differences in returns by gender and population group.

Method

The study is based on linked administrative data accessed through the Central Bureau of Statistics Research Data Center, enabling longitudinal analysis of graduates' demographic and socioeconomic characteristics, educational attainments, employment outcomes, and earnings.

The study population comprised all Israeli citizens born between 1978 and 2000 (aged 22-45 in 2023), who had completed at least 12 years of schooling. The treatment group included graduates of MAHAT practical engineering studies and bachelor's degree graduates who had completed their studies between 2012 and 2022. The comparison group consisted of individuals with upper secondary education only.

Returns were estimated using Mincer wage regressions, controlling for demographic, educational, and labor market characteristics. Estimates were produced separately by field of study and for each of the first 11 years following graduation. Academic fields of study were included in the models to account for MAHAT graduates who subsequently pursued higher education and to facilitate comparisons between returns to MAHAT studies and to academic degrees. Analyses were conducted for the overall population as well as separately by gender and population group, including Arabs, ultra-Orthodox Jews and non-ultra-Orthodox Jews. As a robustness check, propensity score matching (PSM) was also applied, yielding similar results.

Main Findings

The estimated wage return to MAHAT studies was 8.6% in the first year after graduation, increasing to approximately 24% by the fifth. Returns remained relatively stable thereafter, before gradually declining after the tenth year. Nevertheless, returns remained positive throughout the observation period, reaching 16% eleven years after graduation.

Five years after graduation, estimated returns ranged from 7% to 56% across the ten fields with statistically significant returns. The highest returns were observed in software (56%), civil (31%), and mechanical engineering (23%), which together account for approximately half of all MAHAT students. Returns in these fields exceeded those observed in several higher education disciplines, including education (18%) and the non-quantitative humanities and social sciences (22%), despite MAHAT studies requiring only two years, compared to three in higher education institutions.

Moderate positive returns were also observed in electrical engineering (19%), electronic engineering (19%), and water technologies (18%). Lower returns were found in several other fields, while no significant returns were identified

for film, television and sound engineering, for design, or for chemical and biotechnology engineering.

Returns evolved as graduates accumulated labor market experience, although the pattern varied across fields of study. In most MAHAT fields, returns increased during the first years following graduation, and stabilized between the third and fifth years. Academic studies exhibited a more heterogeneous pattern: returns continued to increase over time in high-tech, engineering, and quantitative disciplines, whereas non-quantitative disciplines displayed trajectories similar to those observed for MAHAT studies.

Returns also varied substantially across gender and population groups. Among *ultra-Orthodox women*, software engineering yielded the highest estimated return (107% five years after graduation), although this exceptionally high estimate was likely influenced by characteristics of the comparison group and by unobserved factors not captured in the administrative data. Other high-return fields for ultra-Orthodox women included medical instrumentation (26%) and architecture and interior design (25%). Among *ultra-Orthodox men*, the highest returns were observed in software engineering (59%), followed by civil engineering (47%) and electrical engineering (30%).

Among *Arab women*, medical instrumentation yielded the highest return (47%), followed by civil engineering (17%). Among *Arab men*, the highest returns were observed in electronic (23%), mechanical (23%), and electrical engineering (17%). These differences may reflect unobserved individual characteristics such as motivation and soft skills, differences in specialization within disciplines, and the employment characteristics of the comparison group across population groups.

Conclusions and Policy Implications

The findings provide an empirical foundation for designing funding and incentive mechanisms that encourage technological colleges to expand study fields leading to occupations in high labor demand. They also support policies that guide prospective students toward fields associated with stronger labor market outcomes and higher earnings potential. More broadly, the findings support periodic reassessment of study fields based on their labor market returns and the adoption of differential funding across fields of study.

Although graduates' earnings should not be regarded as the sole measure of the value of post-secondary education, estimates of labor market returns provide policymakers with robust empirical evidence to support decisions regarding resource allocation and program development. The findings further support reconsidering fields with consistently low returns; expanding high-return fields and specializations – particularly those that increase opportunities for women; and continuously updating curricula to reflect technological change and the growing impact of artificial intelligence on the labor market.