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**Analyzing the success factors of the Israel Employment Service placement program**

H i g h i l i g h t s

• Greater unemployment length increases the chance of poor job placement.

• Socioeconomic characteristics are related to the type of job placement.

• Arab job placements are no different from other population job placements.

# Abstract

Unemployment is one of the most challenging tasks the world has faced with 5.39% of the world’s population unemployed in 2019 (3.8% of unemployment in Israel) before the Covid-19 pandemic. Unemployment job placement programs may reduce unemployment length and reduce government unemployment expenditures. This paper explores one of the Israel Employment Service data programs between 2016-2019, based on 56,000 job seekers and 82 job seeker profiles (59% men and 41%women from age 18). The main results of this study are: there is no difference between good placements of the Arabs population (49%) to any other populations (51%); the longer a job seeker stays in the program, the probability to return to the labor market lower, since there is a social-economic impediment such as education, disability, religion, number of children, or other factor that affects placement. Even increasing the number of jobseeker's activities can adversely affect his chances of finding a job.

# 1. Introduction

Today unemployment is a global problem connected to various social disciplines that constitute research topics in fields like economics, sociology, finance, etc. Kabáta et al. ([2014](#Kabata_2014)) describe that there is no doubt that unemployment presents the biggest social problem in the EU. Sol ([2016](#Els_Sol_2016)) states that in EU countries in general a quarter of the unemployed who suffer from economic problems also suffer from health problems, alcohol addiction, and/or discrimination. The longer individuals are unemployed, the more they may lose their skills and become unemployable. This negatively the economy as well. The problems associated with unemployment may result in the unemployed being less healthy, which leads to health-related costs. Winkelman ([2014](#Winkelmann_2014)) finds that higher local unemployment weakens the work ethic, so regions that have higher crime/unemployment/job dissatisfaction relative to other places have a greater impact on unemployment. Artazcoz ([2004](#Lucía_Artazcoz_2004)) describes a strong relationship between unemployment and human and mental health. There are gender differences affecting family responsibility and social status. Areas of high unemployment and social deprivation may also experience higher crime levels, suicide rates, and psychological problems. These include loss of output to the economy, loss of tax revenue, reducing government revenues to spend on public services, an increase in government expenditure, etc. Zwinkels ([2015](#Zwinkels_2015)) notes that the chance of unemployed people returning to work decreases significantly once their allowance is curtailed. For the unemployed the chance of returning to work decreases by 35% and the disabled by 12%. Zwinkels concludes that unemployed persons with problematic debts do not find it more difficult to return to work than other unemployed persons. Research in Amsterdam conducted by Koning ([2014](#Koning_2014)) on social assistance shows that debt relief pathways in the context of employment services do lead to more job placements, and job placement without the relief paths may be relatively limited. A research project among employment service providers in Europe indicates that as soon as unemployed debt improves (i.e., reduction), the chance of working tends to increase, which indicates that debt control for unemployed people in need of social-political assistance increases the chance of returning unemployed to the labor market ([Sol & Kok, 2014](#Sol_Kok_2014)).

In Sweden the unemployment rate stands at 6.5%. Unemployment insurance is comprised of two components: general base insurance (base amount) and loss of income insurance (income-related benefit). Neither of the two components of unemployment insurance is examined by means. The base amount is available to a person who is or is not a member of the unemployment fund or who has not been a member for sufficient time. This means that only a person who pays a month for unemployment insurance will be entitled to a long period allowance to meet the conditions of the membership that entails being a member of the fund or having been associated for at least one year without interruption. However, the applicant is required to fulfill the basic condition and working conditions for receiving a benefit following the base insurance ([Lindquist, 2007](#Gabriella_Sjögren_2007)).

In Finland the probabilities of long-term unemployment (unemployment > 12 months) were calculated for those aged 25-28. 4.5% of women and 7.1% of men experienced or experienced long-term unemployment (out of 46,521) ([Lallukka et al., 2019](#Tea_Lallukka_2019)).

From a global situation examination (as of 27/11/2019), the State of Israel is ranked 10th out of 36 OECD countries with a 3.8% unemployment rate in the OECD rate of unemployment before the Covid-19 pandemic. Israel is below the average of this OECD rate (5.2%) (OECD Unemployment Rate).

The Israeli Employment Service (IES) provides job placement and brokers job placement service to approximately 400,000 job seekers each year through 71 employment bureaus across the country. The IES has established several programs like 'Employment Circuits' (ES). These programs provide tools for placing job seekers in the labor market. This article examines factors that influence the success of job placement in the 'Employment Circuits' (ES) job placement program in Israel which includes approximately 60,000 job seekers ([Israeli Employment Service](#IES)).

# 2. Background

Active labor market policies (ALMPs) are government programs that intervene in the labor market to assist the unemployed find work. Many of these programs grew out of earlier public works projects, particularly those implemented under the 'New Deal,' a series of programs, public work projects, financial reforms, and regulations enacted by President Franklin D. Roosevelt in the United States between 1933 and 1939 and designed to combat widespread unemployment during the Great Depression. There are three main categories of ALMP: (i) Public employment services, such as job centers and labor exchanges, that help the unemployed improve their job search effort by disseminating information on vacancies and by assisting with interview skills and writing curriculum vitae. (ii) Training schemes, such as classes and apprenticeships, to help the unemployed improve vocational skills and hence increase their employability. (iii) Employment subsidies, either in the public or private sector, to directly create jobs for the unemployed. These are typically short-term measures that are designed to allow the unemployed to build up work experience and prevent skill atrophy ([Calmfors, 1994](#Calmfors_1994)).

The Portuguese programs aim to help two target groups: (i) individuals aged less than 25 years (the Inserjovem program), and (ii) individuals aged 25 or more (the Reage program). Program participation is mandatory, and those who refuse to participate face a loss of entitlement to benefits with their registration canceled. The programs are composed of intensive job-search assistance and small basic skills training, for example, writing a curriculum vitae. They include a large number of different responses by the employment office placement team. Each individual is interviewed with placement officers to help her/him improve job-search skills. If deemed necessary, (s)he can enter several vocational or non-vocational training courses. The entire process of job-search assistance ends with the elaboration of a “Personal Employment Plan” that includes detailed information on the unemployed individual's job-search effort. According to this Plan the unemployed individual is expected to meet regularly with the placement officer and to actively search for a job. Unjustified rejection of job offers leads to the cancellation of registration ([Ceneteno, 2009](#Luis_Centeno_2009)).

In Europe, the European Employment Service (EURES) was established in 1994 and works in cooperation with all European countries in finding employment for European residents aged 18-35, where job seekers can look for work in their own country and other European countries in a free platform that enables job interviews via video call, help with moving to the country to which the job requires (residence and flight), language studies, conversion of relevant certificates, etc. According to the EURES website (as of 12.12.2019), there are 2,191,759 jobs and 3,658,553 job seekers who apply for jobs. According to these numbers, almost 60% can be applied for, but still, there will be around 40% without job placement.

Of course, not all jobseekers will be employed, and these numbers are based only on the jobseekers registered for the system those jobs listed there in. Therefore, I shall refer to the figure of the OECD unemployment rate which stands on 6.3% in the EU unemployment (The European Job Mobility Portal).

In China the unemployment index stands at 3.61% (2019). By early 1990 the Chinese government began efforts to introduce labor market enforcement and standardization policies that strengthen and assist businesses in employee search, job placement, and adjustment. China has developed a strong information system infrastructure (The Hùkǒu System that is a population registry system that contains all pertinent information) in which jobseekers can help and assess their suitability for the roles they wish to enlist. In 1999, the Chinese government required all social sectors to adopt and use this system and pay attention to the school certificates and other qualifications to increase the ability and employment prospects (Yan DI, 2006).

The Japanese unemployment rate is 2.3% in the OECD. In Japan the unemployed or those who have lost their eligibility do not have the right to unemployment benefits, thus there is a very strong incentive to find work. In this specific situation, the Japanese Employment Service does not have to put a great deal of effort into running job placement programs. As a result efforts in Japan, as measured by public spending efforts on placement policies, are relatively small. In 2011 Japan spent less than 0.3% of GDP (gross domestic product) on placement policies, less than half the OECD average ([Martin, 2014](#Martin_2014)).

Crost (2016) analyzes the effect of a type of workfare program, Germany’s "Arbeitsbeschaffungsmaßnahmen" (ABM), on life satisfaction. Previous studies have found evidence that participation in ABM reduces the probability of finding employment in regular jobs, at least for some groups, so that the program’s long-term employment effects could offset the positive short-term effect on subjective well-being. Still, our findings have important policy implications, suggesting that jobs created by active labor market policies can at least partly offset the negative effects of unemployment on subjective well-being.

Participation in active labor market programs (ALMPs) is mandatory for all unemployed persons in Denmark who receive unemployment benefits, and who have been unemployed for more than 12 months. Extensive literature has analyzed the effect of ALMPs on the unemployed person’s reemployment probabilities and subsequent earnings, and hence of the probability that the programs prevent the unemployed from falling into poverty ([Andersen, 2011](#Signe_Hald_Andersen_2011))‎.

The United States runs a considerable number of employment and training programs, spanning numerous government agencies. Although those run solely by the United States Department of Labor (USDOL) are relatively small, the plethora of programs creates considerable administrative burdens for the Public Employment Service (PES) staff. One of them is the Job Training Partnership Act (JTPA). The goal of JTPA is to ensure that the types of training offered to job seekers reflect the needs of the local area. They must also meet detailed federal requirements on program acceptance, encompassing criteria such as income and age. The programs appear well targeted at their intended groups. Evaluation evidence on the impact of the JTPA is decidedly mixed. Classroom training does not appear to help any target group, i.e., men, women, or youths. Although on-the-job training does appear effective for men and particularly women, it only assists a relatively small number of individuals, and it is unlikely that it can be expanded significantly without some negative labor market effects setting in. Unfortunately, the reasons behind the overall lack of success for JTPA remain unclear. More research is needed in this area to update these findings ([Head of Publications Service, 2000 OECD](#Head_of_Publications_Service_2000)). The statistical data on the "workers" seems to indicate that factors such as age, sex, race, lack of education, and length of unemployment do not significantly affect job placement rates ([The United States Congress House Committee on Education and Labor, 1979](#Book_1979)).

In January 2012, Israel's Central Bureau of Statistics (CBS) began conducting its Labor Force Survey under new guidelines. Among the Jewish population (men and women) the new survey did not result in a markedly different reported unemployment rate. In the Arab population, however, there was a dramatic hike in the unemployment figures, roughly doubling the previous rate among men and tripling it among women. This rise also implies an increase in the national unemployment rate ([Taub Center Staff, 2012](#Taub_Center_Staff_2012)). A close look at the unemployment data reveals that unemployment is severe not only in the Arab and Jewish sectors overall but also in all the gender, age, education, and geographical groups. In groups that generally show high unemployment, the structural component of increased joblessness can be explained. For Arabs, however, the data were the opposite of what would be expected according to the argument that despite the decline in the labor-force participation rate of groups with high unemployment, during the same period the average total unemployment rate increases. In recent years there has been a dramatic change in the sectoral (Jewish-Arab), gender, age, and education composition of the Israeli labor force ([Miaari, 2008](#Miaari_2008)).

Israel, like the rest of the world, has established the "employment service," a government organization that serves the public and operates directly with the National Insurance Institute (NII). Following its establishment, searches began for a master plan that would constitute an initial milestone, and indeed it did. In 2004, Israel established a program called the "From Income Guarantee to Secured Employment" (FIGSE), which operated until 2007. FIGS was like the United State program called the "Personal Responsibility Law and Employment Opportunities Law" or the well-known "Wisconsin Plan". The main aim of the Israeli program was to convert some of the people living in poverty from relying on NII benefits to the labor market. The FIGSE program was one of the Israeli government's flagship programs in dealing with poverty and adversity. However, even before it was activated, in the long discussions about its characteristics, it became a target of severe criticism by political parties, social organizations, and a portion of the target population. Following many criticisms of the program, the program was closed. Israel is currently working on several levels to eradicate the phenomenon of unemployment. In the employment service, for example, several programs have been established to provide tools for placing job seekers in the labor market. Some of the programs are targeted to more orthodox men or orthodox women, some for both genders with no emphasis on the orthodox community, some to secular people, and some to a variety of people ([Benish, 2006](#Avishai_Benish_Wisconsin)).

Implementation of programs in countries like Portugal and Denmark are very similar to the Israeli programs in which emphasis is given on providing the job seeker real tools or courses that provide skills to find be accepted to jobs. Participation is mandatory, and otherwise the government funding stops. Like Europe, Israel provides a job search platform only to IES registered users. The Japanese do not have unemployment benefits. They require the jobseeker to find a job in any way, something that most of the world does not believe in. Any program has its pro’s and con’s. Some have succeeded more than others, and some have failed or not reach their accomplishment due to diverse causes. Without these programs unemployment among society would have a greater impact.

# 3. Data Extraction and Factorize

The database containing 82 columns and 55,989 rows (each row presenting a job seeker have joined the ES program and each column presenting a jobseeker characteristic like family status, religion, age, number of children, education, etc.). The data were collected for the period from 2016-2019. Data reclamation findings were 14% of empty cells, and 86% complete data.

***Table 1****Social-economics features \**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Features** | | **Weight**  **(%)** |  | **Features** | | **Weight**  **(%)** |
| Gender | Male | 41% |  | Disability | None | 91% |
| Female | 59% |  |  | 1% - 19% | 1% |
| Age | 18-29 | 16% |  |  | 20% - 39% | 4% |
| 30-39 | 27% |  |  | 40% - 59% | 2% |
| 40-49 | 34% |  |  | 60% -100% | 2% |
| 50-54 | 15% |  | Family Status | Single | 31% |
| 55+ | 7% |  |  | Married | 45% |
| Religion | Jews | 43% |  |  | Divorced | 21% |
| Muslims | 46% |  |  | Widow | 3% |
| Druze | 3% |  |  | Unknown | 1% |
| Christianity | 2% |  | Number of kids under 18 | None | 40% |
| Other | 6% |  |  | 1 - 3 | 42% |
| No Religion | 0% |  |  | 4 - 6 | 15% |
| Single Parent | Yes | 11% |  |  | 7+ | 3% |
| No | 89% |  | Military Service | None | 82% |
| Education | Primary School | 20% |  |  | Sherut Leumi | 2% |
| Part Secondary school | 19% |  |  | Military Service | 17% |
| Secondary school | 45% |  | Unemployment duration | <1 year | 8% |
| Bagrut certificate | 4% |  |  | 2 - 3 years | 9% |
| First Degree | 3% |  |  | 3> years | 82% |
| Second Degree | 1% |  |  | None | 0% |
| Third Degree | 0% |  | Disability | None | 91% |
| Associate degree | 2% |  |  | 1% to 19% | 1% |
| License | 0% |  |  | 20% to 39% | 4% |
| No Education | 4% |  |  |  |  |

\* based on 55,989 job seekers

To arrange the data for analysis, it was necessary to categorize the columns, then to summarize the data ([Table 1](#Table_1)). 1860 unique activities were categorized to in 30 unique categories. The age column is categorized in groups of 18-29, 30-39, 40-49, 50-54, 55+. Education is divided into categories: elementary, high school, degree, professional certificate, and no education. The disability percentage column is divided into categories: [0,1), [1,20), [20,40), [40,60), [60,100]. The language column has many options and combinations between languages, because each language has a several level types, therefore all extensions can be subtracted and left with only the name of the language. Licenses column has been converted from subdivision of categories into general categories. Family Status is controversial (values such as vacancy, polygamy, alliance, prescription), so it is converted into main: single, married, unknown including a widow(er), and divorced. The number of children up to the age of 18 has been cataloged by 0-7, 8+.

Changing the "Activities that went through the program" column was a must, because when employees of the IES open a new activity, they can give a free text to the program name and not choose one from a predefined list. Therefore, 1860 unique values were created and had to be filtered, categorized, thus creating a predefined list of smaller and pre-agreed activities. After manipulating the data, only 30 unique activities remained. After these actions, all activities had to be deployed to indicate whether the jobseeker was in the same activity, if the jobseeker was in the activity receiving the value 1, and if not receiving value 0.

The 'Depth of unemployment in months' column values from 0 to 100 were divided by 10 with the result rounded to get a categorical column. The 'Education' column also has numerous values that can be entered in free text, so it is divided into categories: elementary, high school, degree, professional certificate, and no education. The "Religion" column is also divided into the major religions: Jewish, Christian, Druze, Muslim, and other. Of course, each one contains several types, so it was decided to group them. Edge cases do not affect the data and are grouped as 'Other.'

# 4. Hypotheses, Success Definition, and Methodology

The goal had to be defined for investigation and analysis. The concept of "success" was interpreted differently in each situation. For research purposes the success index was divided into 4 categories, labeled as follows:

1. Amazing Success: No revolving door cases (job seeker has returned to the program in 3 months since he was placement in a job), job placement since entering the program = 1 and no resumption date.
2. Medium Success: No revolving door cases, job placement since entering the program > 1, no renew activity date, and no renew registration date.
3. Weak Success: All job seekers who not in label 1, 2 or 4.
4. Failure: No resumption date, no job placements since joining the program, nor revolving door cases higher than 0.

Research questions:

(Q1) Is there a difference between good job placements for the Arab population compared to other populations?

(Q2) How long are job seekers in the program before job placement?

(Q3) Is there a difference between the time length of a jobseeker in the program to the type of job placement?

(Q4) Do the number of activities from the program affect a job seeker's job placements?

(Q5) Is there an effect between socio-economic jobseeker characteristics and job placement?

## (Q1) Is there a difference between good job placements for the Arab population compared to other populations?

In 2015 the percentage of labor market employment in the Arab community was 54.6% compared to 81.7% in the Jewish community ([Ministry of Labor, Social Affairs and Social Services, 2015](#Ministry_of_Labor)), and in 2016 the Arab employment rate was 42.5% ([Central Bureau of Statistics, 2017](#Central_Bureau_of_Statistics)). The number of unemployed Arabs is larger and requires action. The Israeli government has undertaken affirmative actions in the Arab sector and provides funds for employment opportunities to grow, a fund for education (scholarships, reduced taxes, etc.), and other programs. There are many reasons for affirmative actions like cultural differences, traditions, geographical environment, social status, etc. The IES receiving government funds (NIS 1.2 million) for "Tapuah" (the program gives NIS 1.466 million) [(Israeli Employment Service, 2017](#Israeli_Employment_Service)) specifically for Arab sector, but there is no evidence to justify opening special programs to the community at program expense, nor is there evidence to show that 'Employment Circuits' has a negative or non-effect on Arabs. The hypothesis that there is no difference in their job placement in the 'Employment Circuits' program will be examined with .

(1)

There is a need to see if the data are distributed in normal groupings. Therefore, we needed at least 30 bureaus in which the number of Arabs constitutes a statistical basis for the hypothesis (at least 14 Arab jobseekers in the bureau needed to reach 30 unique bureaus). A comparison was made between the Arabs with good job placement and the non-Arabs with a good job placement from the same bureau. The 'diff' column was calculated, and it represents the differences in the good placing proportion to estimate the differences in job placements in the same bureau. There is a need to check if the differences are normally distributed. A histogram shows the number of samples relative to the difference and by a density function. The density function implies that the data constitute a normal distribution. A Kolmogorov Smirnov test result shows the column data are normally distributed even by equalization between the cumulative distributions function to the Kolmogorov Smirnov result.

Since we have 30 samples and we saw that the data is normally distributed, we used a T-test to examine the difference between dependent pairs (30 of 71 bureaus). It is assumed that there are more similar characteristics to populations from the same bureaus. The critical value was higher than alpha; therefore, the conclusion is to not reject the null hypothesis and conclude there is no significant difference between the job placement of the Arabs and the job placement of the non-Arabs.

## (Q2) How long are job seekers in the program before job placement?

A copy of the data was made into a new file and transferred to the data frame with the columns of "Last Job Placement Date," "Last Job Placement Report Date," and "Initial Entry Date." Some data have blank dates ("NAT"). To understand how long the jobseekers in the program, a calculation was made in the 'day diff' column.

Almost half (49.99%) of program participants do not have a "placement date," and more than 25% have "first entry date" greater than "last placement date". After clearing the records of the negative diff, the data were summarized. Confidence interval for job seekers in the program is: (Left: [336.994], Mean: 341.418, Right: [345.8417])

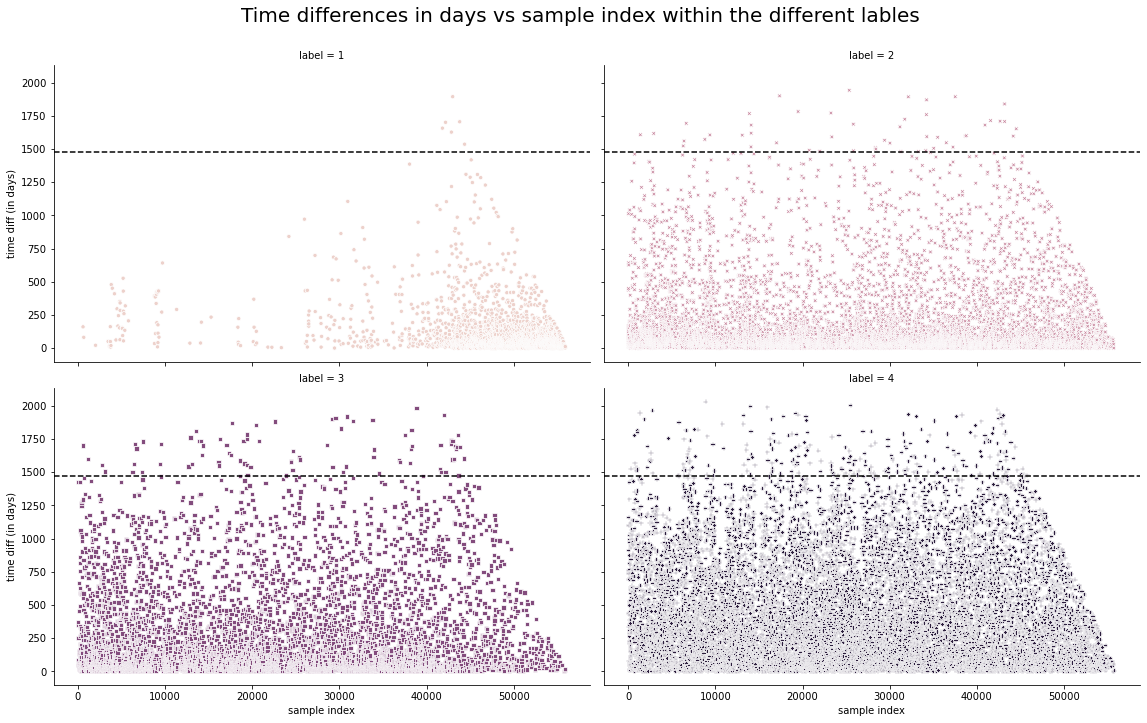
***Table 2*** *Division to categories*

|  |  |  |
| --- | --- | --- |
| Percent of job seekers | Number of job seekers | Category |
| 0.366% | 205 | 0 days |
| 2.865% | 1604 | 1 – 10 days |
| 5.067% | 2842 | 11 – 30 days |
| 5.564% | 3115 | 31 – 60 days |
| 4.574% | 2561 | 61 – 100 days |
| 4.081% | 2285 | 101 – 150 days |
| 3.074% | 1721 | 151 – 200 days |
| 7.212% | 4038 | 201 – 365 days |
| 17.191% | 9625 | Above a year |
| 49.997% | 27993 | None |

## (Q3) Is there a difference between the time length of a jobseeker in the program to the type of job placement?

Is there a difference between the time length of a jobseeker in the program to the type of his job placements? Does longer attendance in this program give more tools to a jobseeker to find a job? Is this the reality? And if so, a longer stay needs to yield better job placement. Another hypothesis questions if there is a difference between the time of job seekers in the program to the type of job placements; the question is examined with

*Figure 1. Time of jobseeker in the program division by label*

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The division of different labels and the length of their being in the program ([Figure 1](#Figure_1)) hint that a better label has a shorter time frame in the program (vice versa to the thought of longer stay need to return a better placement). To test if each label is normally distributed, the Kolmogorov Smirnov test was made to every single label. The results show the data in each label are normally distributed. To check the difference between the day's differences between the different labels an ANOVA test was performed. The results within labels show a difference between the different label groups. To know which label has a difference with another, a Tukey *Post Hoc* test was made to test time differences between each label pair separately.

***Table 3*** *Tukey Post Hoc Test*

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| hedges | ρ | T | tail | se | diff | Mean(B) | Mean(A) | B | A |
| -0.286 | ~ 0 | -11.964 | two-tail | 8.574 | -102.577 | 229.087 | 126.509 | 2 | 1 |
| -0.479 | ~ 0 | -19.723 | two-tail | 8.705 | -171.698 | 298.207 | 126.509 | 3 | 1 |
| -0.947 | ~ 0 | -41.959 | two-tail | 8.087 | -339.326 | 465.836 | 126.509 | 4 | 1 |
| -0.193 | ~ 0 | -11.061 | two-tail | 6.249 | -69.121 | 298.207 | 229.087 | 3 | 2 |
| -0.661 | ~ 0 | -44.216 | two-tail | 5.354 | -236.749 | 465.836 | 229.087 | 4 | 2 |
| -0.468 | ~ 0 | -30.133 | two-tail | 5.563 | -167.628 | 465.836 | 298.207 | 4 | 3 |

The Tukey *Post Hoc* test results ([Table 3](#Table_3)), we can say confidently that between all the mean pairs there are differences such that the means decreases with the decrease of the labels. This is based on the two test results that were hypothesized.

(Q4) Do the number of activities from the program effect a job seeker's job placements?

Only 30 unique activities are defined in the data frame. It was necessary to change the "Activities in the program" column to a categorical variable and layout the activity in a new column to provide a binary classification if the job seeker was in the activity = 1 if not 0, to check the hypothesis that more activities performed by job seekers will cause decreasing labels.

*Figure 2. Number of programs per label*

[Figure 2](#Figure_2) shows the sum of all activities in which the label was assigned was calculated to and see the percentage of all activities.

***Table 4*** *Percent of jobseekers from each label and activity*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Label | Change course | Process course | Occupational Hebrew course | Computer application course | Personal training | … | Number of programs |
| Label 1 Fraction | 4% | 4% | 5% | 0 | 4% |  | 4% |
| Label 2 Fraction | 14% | 12% | 14% | 7% | 13% |  | 13% |
| Label 3 Fraction | 11% | 9% | 8% | 0% | 12% |  | 11% |
| Label 4 Fraction | 71% | 75% | 73% | 93% | 72% |  | 73% |

According to the above table ([Table 4](#Table_4)), anyone with Label 1 seems to greatly reduce his number of activities in general and in each activity in any other label. It was necessary to see if there is a significant difference in the variance between activities in the program with the ANOVA test. First, we had to check if the data are normally distributed. A Kolmogorov Smirnov test shows significant results with each number of programs per label; therefore, the ANOVA test was performed, and the of ANOVA was ~0. This indicates there is a significant difference between different activities and the time when job seekers are on the program. It was necessary to continue investigating the difference between activities using the Tukey *Post Hoc* test.

***Table 5*** *Tukey Post Hoc test for checking differences between pairs of labels*

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| hedges | ρ | T | tail | se | diff | Mean(B) | Mean(A) | B | A |
| -0.12 | 0.001 | -5.251 | two-tail | 0.033 | -0.174 | 1.14 | 0.967 | 2 | 1 |
| -0.082 | 0.002 | -3.548 | two-tail | 0.034 | -0.119 | 1.068 | 0.967 | 3 | 1 |
| -0.198 | 0.001 | -9.696 | two-tail | 0.03 | -0.287 | 1.253 | 0.967 | 4 | 1 |
| 0.038 | 0.103 | 2.277 | two-tail | 0.024 | -0.055 | 1.068 | 1.14 | 3 | 2 |
| -0.078 | 0.001 | -6.224 | two-tail | 0.018 | -0.113 | 1.253 | 1.14 | 4 | 2 |
| -0.116 | 0.001 | -8.862 | two-tail | 0.019 | -0.168 | 1.253 | 1.068 | 4 | 3 |

[Table 5](#Table_5) shows there is a difference in the number of activities between the different types of successes (label), except for Groups 2 and 3. After exploring all the different activities as individuals, a decision tree model that takes a sample of jobseekers and matches their socioeconomic characteristics and activities compared to the data frame from which it was sampled will be helpful to see it graphicly. The model models jobseekers and presents the most definite trajectory for them according to jobseekers whom he resembles, both in terms of their programs and in terms of socioeconomic characteristics. The decision to use the decision tree is was based on the will to show the most recommended route (order of action). There are many other models for this kind of decision, but after considering alternatives it was decided that this model is best for the given situation. The model shows the most definite trajectory, so the tree should be considered as the order of best practice for those sampled jobseekers. Of course, the tree is no definite promise that according to the proposed route jobseekers will be helped in this way.

## 

## Q5: Is there an effect between socio-economic jobseeker characteristics to placement?

This question was asked to see if there is a socioeconomic characteristic that affects job placement more than other characteristics. The definition of socioeconomic characteristics of jobseekers is religion, age, single parent, gender, level of education, city, language, country of birth, marital status, children up to age 18, classification of the jobseeker, disability rates, medical disability, licenses, military service, released prisoner, and month of job placement ("last job placement date"). After building a new data frame that consists of these columns, sorted data was inserted. Any country of birth with less than 1% frequency was dropped from the data because they are end-cases that do not affect the results below. A multinomial regression model was used to compare the model with all variables to the cutter model.  
McFadden's formula subtracted the estimate log distribution from 1. Therefore, the higher the resulting value (between 0 and 1), the more pronounced the model is.

Multinomial multivariate regression makes it difficult to reach a result close to 1, because very strong explanatory parameters are needed to increase the value of McFadden's estimate. In attempting to play with the model and to interplay variables and remove irrelevant variables, no more statistically significant result was obtained than from the full model. In the case of our data, the McFadden estimate is 0.239. According to McFadden the estimate for a good fit model is between 0.2 and 0.4 [[1977](#Daniel_McFadden_1977)], so it can be said to be statistically significant and that there is a correlation between the socioeconomic variables and the type of job placement. The variables presented by the model are more likely to influence the job placement group. Some of the model results are common sense thinking, but others are surprising.

All model results are compared to Label 4 (failure), and each model result displayed is significant (ρ < 0.05).

* There are more Arab cities compered to Jewish cities in Labels 1 and 2.  
  Muslim and Jewish religions are significantly more in Label 1.  
  This supports Question 1 results and conclusions.
* Some country origin affects program success. The Soviet Union and France are significantly more in Label 3 than Label 1 (compered by p-value).  
  Ethiopia significantly are more in Label 2.
* Education has a strong effect on the success label. Academic degree or 'Teudat Bagrut' is significantly more in Label 1, and non-education is significantly more in Label 3.
* Disability affects human life including program success. From 20%-59% significantly more in Label 2 and 60%-100% in Label 3. There is no significant disability in Labels 1 and 2 as expected.

# 5. Conclusions

This research examines the success factors of the Israeli Employment Service (IES) 'Employment Circuits' program. There is no difference between the job placement of the Arabs and that of non-Arabs. The number of jobseekers placed through the program is 50%, which indicates a low rate of job placements. The average time attending the program before job placement is 341 days. It is proven that the longer the jobseeker is in the program, the quality of his job placement (label) decreases. A decision tree model was established to assess the effect between program activities on jobseekers' placements; it has supported the result of the previous finding. The multinomial regression model was established to assess the relationship between unemployment to a jobseeker’s socioeconomic characteristics (religion, age, single parent, gender, level of education, city, language, country of birth, marital status, children up to age 18, classification of the jobseeker, disability rates, medical disability, licenses, military service, released prisoner, and month of job placement) to job placements. Some of the model results can be present as common-sense thinking, but some are surprising. For example, there are more Arab cities compared to Jewish cities in Labels 1 and 2. Muslim and Jewish religions are significantly more in Label 1. Some country origins influence program success; the Soviet Union and France are significantly more in Label 3 than Label 1, and Ethiopia is more in Labels 2 and 3. Education has a strong effect on the success label. An academic degree or 'Teudat Bagrut' is significantly more in Label 1, and non-education significantly is more pt to be in Label 3. Disability influences program success. From 20% to 59% are significantly more in Label 2 and 60%-100% in Label 3. There was no significantly more disability in Labels 1 and 2 as expected.

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