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Do Israelis Work More or Less?

The Elasticity of Employment in the Labor Market

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Do Israelis Work More or Less? The Elasticity of Employment in the Labor Market

Michael Debowy, Gil S. Epstein, and Avi Weissh

Background

Do Israelis work more or less than people in other countries? Which population groups in Israel work more and which work less? And how do factors like wage levels, the tax burden, and childrearing affect employment and the number of work hours? This study attempts to answer these questions and to examine the scope of employment and its elasticity with respect to various factors in the current Israeli labor market.

An international comparison between Israel and OECD countries shows that, in the last decade, Israel has enjoyed a significant advantage of several percentage points in the overall employment rate. This advantage is primarily due to much higher employment rates among Israeli women compared to their counterparts in other high-income countries (Figure 1). Additionally, the average number of working hours for employees in Israel is higher than that of employees in other countries (Figure 2).

The topic of labor input and its sensitivity to various factors is crucial in the discussion on accelerating economic growth. It complements the discussion on labor productivity (as extensively discussed by the Bank of Israel, 2023, for example) for analyzing final output and growth.

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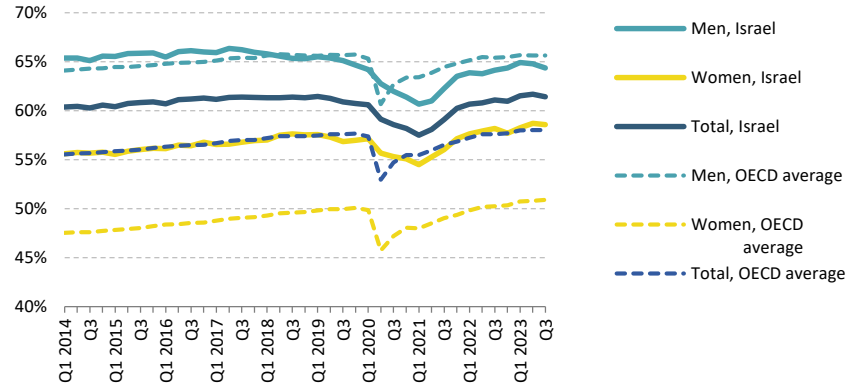
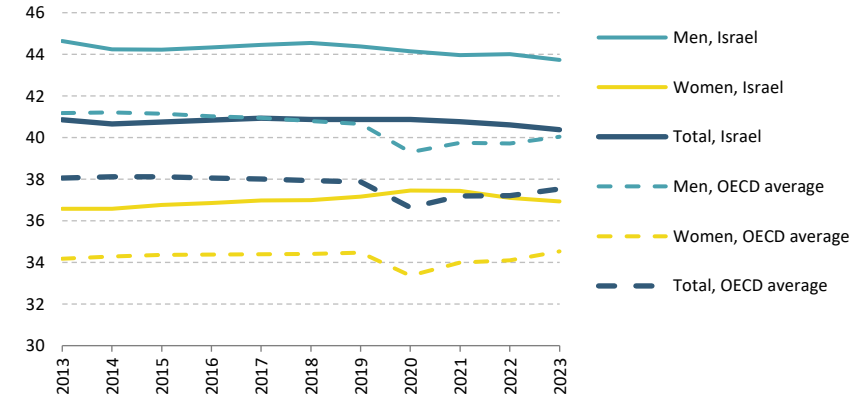
Figure 1. Labor participation rates (quarterly) by gender, Israel and the OCED average



Source: Michael Debowy, Gil Epstein, and Avi Weiss, Taub Center | Data: OECD

Figure 2. Weekly work hours for employees, by gender

Annual average



Source: Michael Debowy, Gil Epstein, and Avi Weiss, Taub Center | Data: OECD

This study relies on the Household Expenditure and Income Survey conducted by the Central Bureau of Statistics over the past decade, which includes data on about 66,000 individuals of working age. We found that, on average, a 10% increase in wages increases the employment rate of men by 2.5 percentage points and that of women by 3.1 percentage points, while increasing average work hours of men by 4.5% and that of women by 5.6%. Nonetheless, there is a significant degree of variation in elasticity across genders and population groups. It was also found that each additional child in the household reduces women's employment rate by 3 percentage points and their work hours by 13% on average, while it does not have a significant effect on men in a population-wide cross-section. Finally, we found — perhaps unsurprisingly — that the presence of children affects the labor supply of Haredi (ultra-Orthodox Jewish) women much less than that of non-Haredi Jewish women and Arab women, and that the employment of Haredi men decreases with the number of children.

Following the empirical estimation, we present two examples of policy implications based on our findings. In the first, we examine the theoretical effect of a small change in the effective income tax imposed on workers (using the actual tax in the sample as the starting point) and show that raising the income tax rate will not lower the tax revenues despite the ensuing reduction in labor supply. The second example examines the theoretical implications of the government financing free education from birth, under various assumptions about the impact such a measure will have on the labor supply, utilizing our estimates of the effect of the presence of children at home on labor force behavior. This analysis suggests that if access to educational frameworks affects parental employment, as shown in other studies,[1] then free education from birth could significantly increase the labor participation of women (and of Haredi men) and substantially reduce gender employment gaps.

1 See for example Schlosser, 2011 and Shachar, 2021.

Literature review

The supply of labor and its elasticity have long been the subject of theoretical and empirical study.[2] The elasticity of labor supply with respect to wages — namely, the percentage change in employment and work hours following a change of one percent in wages — has a particularly wide range of estimates in the literature: from zero to greater than two.[3] Researchers typically distinguish between the extensive margin (the effect of the offered wage on the likelihood that a person will work at all) and the intensive margin (the effect of wages on the number of work hours of an individual who is already working or has decided to work). In a review of both macroeconomic and microeconomic studies, Chetty et al. (2011) found an employment elasticity of 0.25 and a work hour elasticity of 0.3. In a report by the Congressional Research and Information Center, McClelland and Mok (2012) presented much lower estimates: an employment elasticity of between 0 and 0.1 and a work hour elasticity of between 0.1 to 0.2. Jäntti et al. (2015) examined the issue using data from 13 high-income countries and found an employment elasticity of 0.02 for men and 0.1 for women and a work hour elasticity of 0.3 for men and 0.2 for women.

To understand some of the reasons for the variation in results, Bargain and Peichl (2016) conducted a comprehensive meta-analysis based on 90 previous studies in high-income countries. The researchers concluded that, contrary to other characteristics such as the country selected or the estimation method, the year of the study significantly affected the estimates. The reviewed studies showed a long-term trend of *decreasing* employment elasticity in the Western world from the 1980s to the 2000s. The researchers also highlighted recurring demographic patterns: higher elasticity for single mothers, lower elasticity (often zero or not statistically significant) for men (regardless of their marital status), and varying elasticities for married women based on their starting point in the relevant labor market (a lower elasticity when a high proportion of women are already participating in the labor market, as in Israel).

There have not been many studies of the elasticity of labor supply with respect to wages in Israel, at least not as the main focus of the research. In a historical study, Elkayam (1989) estimated an elasticity of 0.2–0.5 in the business sector

2 See for example Hausman, 1985 and Frisch, 1959.

3 We focus on the Marshallian elasticity rather than the Hicksian, although the literature implies that they are similar in size in the labor market (see Chetty et al., 2011).

between 1962 and 1984. Ben-Zeev and Shai (2017) examined the issue from a novel perspective by investigating the impact of the 2008 Sabbatical Year (shmita; the census year used by the researchers) on wages, and in turn on the labor supply in agricultural areas within Israel's biblical borders relative to other areas. The researchers focused on adjacent and similar areas on either side of the biblical border of the area in which the sabbatical laws apply, finding an elasticity of 0.2–0.6 for work hours (with no evidence for the elasticity of employment).

The literature on the impact of childbirth and parenting on employment and wages — especially in the case of mothers — began in the last century (Gornick et al., 1997; Hoffman, 1960). Gutierrez-Domenech (2005) examined the impact of the first birth on women's employment in five European countries between 1973 and 1993, and found that, while it impacts women's employment overall, there are significant differences across countries and over time, some of which are related to a country's policies. Bertrand et al. (2010) focused on highly educated women with high earning potential (graduates of prestigious MBA programs in the US) and found that employment and wage gaps between them and their male counterparts — almost nonexistent at the start of their careers — begin to widen even before the birth of children. They also found that parenthood has a more significant impact on the choice of workplace and the scope of employment among women than among men, further widening the wage gaps over the course of their careers. Angelov et al. (2016) conducted a similar examination using administrative data in Norway, while widening the scope of the research with respect to level of education, and found similar results. Their study indicated not only that childbirth and parenting increase employment and wage gender gaps, but also that the effect increases as the mother's education level decreases relative to the father's. Similar findings were also observed in studies conducted in the US (Chung et al., 2017) and Denmark (Kleven et al., 2019).

Other studies have examined the impact of early childhood education policy on parents' labor supply. Havnes and Mogstad (2011) explored the effect of expanding access to subsidized early childhood education frameworks in Norway and found that it had no impact on mothers' labor supply. In contrast, Bousselin (2022), who conducted a similar examination following a reform in Luxembourg, found that expanding access to early childhood education frameworks significantly increased the employment and work hours of mothers.

Various studies have examined the effects of child allowances and access to early childhood education frameworks on labor supply in Israel, with emphasis on the early 2000s (immediately after the cuts in child allowances and the expansion of compulsory education to ages 3–4). Mazar and Reingewertz (2018) found that reducing child allowances increased the labor supply of men and women with a large number of children relative to those with fewer children. Schlosser (2011) found that expanding access to early childhood education frameworks led to a sharp increase in the labor supply of Arab mothers, especially among the educated, and Shachar (2021) found that the cost of early childhood care has a significant negative impact on mothers' labor supply. Yakin et al. (2021), who conducted a more extensive and updated measurement of the motherhood penalty, found that among non-Haredi Jewish women, there is an expected decrease of 7% in employment rate and 27% in weekly work hours following the birth of a first child (for workers), and, overall, the motherhood penalty explains about half of the gender gap in labor income.

Data and descriptive statistics

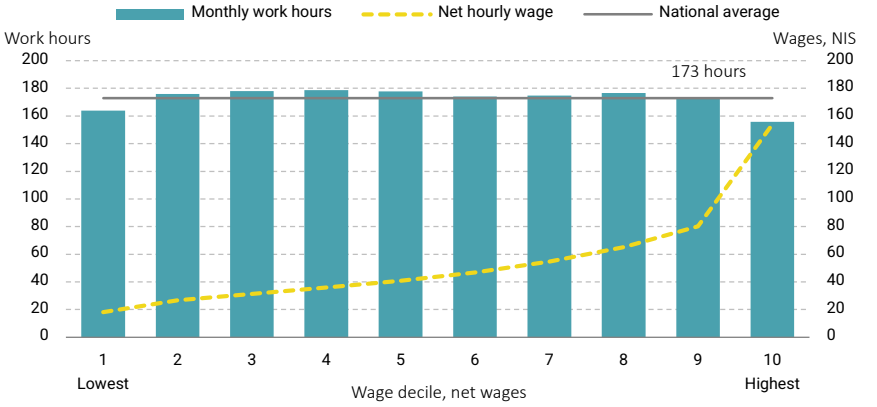
To conduct the research, we relied on data from the Household Expenditure and Income Survey conducted by the Central Bureau of Statistics between 2014 and 2019. It includes data on about 66,000 individuals aged 25–65, of whom approximately 48,500 were working in the relevant survey year. For each individual, data were collected on employment, gross and net labor income, work hours, education, age, gender, marital status, ethnicity and nationality, occupation, and economic sector (if employed), alongside household-level characteristics such as geographic region, level of religiosity, family size, and household income. All income data were adjusted using the Central Bureau of Statistics consumer price index to reflect real wages in terms of 2019 purchasing power.

The data show that during the sample period, Israeli workers worked on average about 173 hours per month (about 40 weekly hours), for an average net hourly wage of NIS 56 (NIS 71 gross) in 2019 purchasing power terms. There is significant variability in work hours across the wage scale (Figure 3). Among the middle 80% of the hourly wage distribution (deciles 2–9), there is a tendency to work slightly more hours than the national average (by 1%–3%); in the bottom decile, the average is about 5% less than the national average;

and in the top decile it is about 10% less. When analyzed using monthly wage deciles, there is a more consistent correlation between hourly wage and work hours (Appendix Figure 1).

Figure 3. Average monthly work hours and average hourly wage, by net income decile, 2014–2019

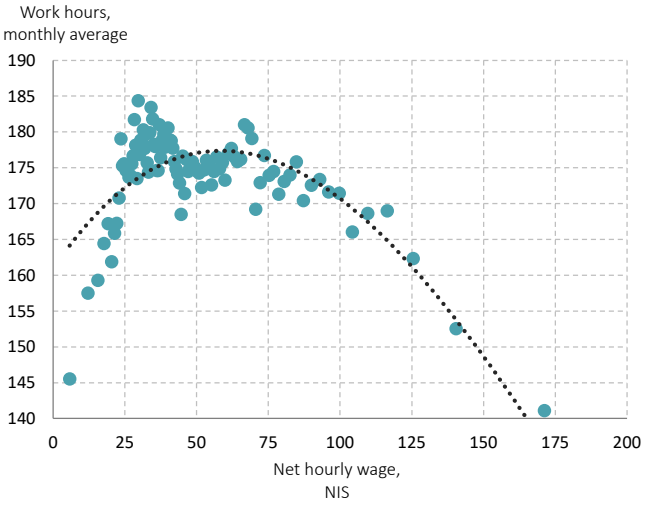
NIS, 2019 prices



Source: Michael Debowy, Gil Epstein, and Avi Weiss, Taub Center | Data: CBS

Figure 3 presents monthly work hours and average wage by net hourly wage deciles. The figure reveals that the observed differences in work hours are not large, amounting to gaps of at most 23 monthly work hours (about 5 weekly hours). However, a more detailed breakdown of the income distribution reveals more significant differences. Figure 4 shows the correlation between the number of monthly work hours and the net hourly wage according to wage percentile. The figure reveals greater variability in work hours, alongside a clearer relationship between work hours and wages.

Figure 4. Correlation between work hours and wages, 2014–2019
NIS, 2018 prices



Note: Each point on the graph represents an average based on net hourly wage percentile (about 480 workers). The graph's boundaries exclude the top percentile (where the average hourly wage is higher than NIS 200 and the average number of work hours is less than 140), but the trend line (based on a third-degree polynomial) takes it into account. Appendix Figure 2 presents the full picture.

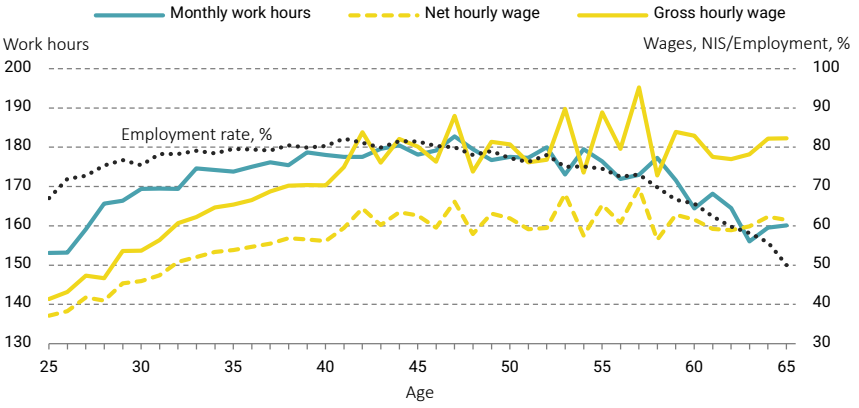
Source: Michael Debowy, Gil Epstein, and Avi Weiss, Taub Center | Data: CBS

According to the trend line depicted in Figure 4, work hours increase with wages up to a range of NIS 50–70 and subsequently decline. In addition, the variance of wages explains approximately 84% of the variance in hours worked. This statistical correlation may suggest the influence of wages on work hours or vice versa. However, the correlation alone does not offer clear insights, since numerous intervening factors that impact both employment and wages, undoubtedly play a role in this relationship. We will now discuss some of those factors in detail.

Figure 5 presents average monthly work hours (on the left vertical axis) for employees of various ages, alongside their hourly wage (both gross and net, on the right vertical axis), and the employment rate. Within the general population, it can be seen that while the employment rate and work hours (for those who are employed) generally increase with age up to 45–50 and then decline, hourly wages continue to rise until around the age of 55–60 (note that

this refers only to the simple average for individuals of each specific age). It is evident that significant gender differences exist across the entire age spectrum (see Appendix Figures 3a and 3b for more details).

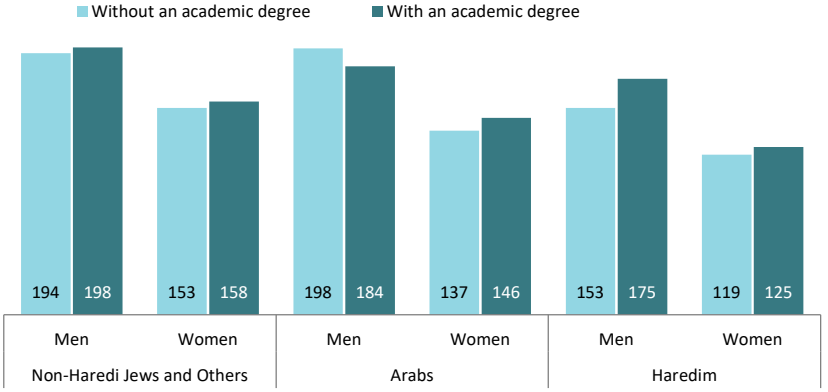
Figure 5. Employment rate, average monthly work hours, and average hourly wage, by age, 2014–2019



Source: Michael Debowy, Gil Epstein, and Avi Weiss, Taub Center | Data: CBS

Substantial variability is also evident when comparing different population groups. Non-Haredi Jewish men (with an employment rate of about 85%) and Arab men (78%) worked on average between 195 to 196 hours monthly, in contrast to 157 hours for Haredi men (53%). Non-Haredi Jewish women, with an employment rate of 78%, worked on average 156 hours per month, while Arab women (45%) and Haredi women (70%) worked only 140 and 120 hours, respectively. A further breakdown by education level (Figure 6) reveals that individuals with academic degrees tend to work marginally more hours than those without, with a negligible average difference of about 1%. However, this difference is more pronounced among the most economically disadvantaged workers: Haredi men with academic degrees work approximately 14% more hours than their counterparts without degrees, and among Arab women, the gap is around 7%. The only group in which those with an academic degree tend to work fewer average hours is Arab men, with those with a degree working 7% fewer hours than those without, despite higher employment rates and average wages.

Figure 6. Average monthly work hours, by sector, gender, and education, 2014–2019

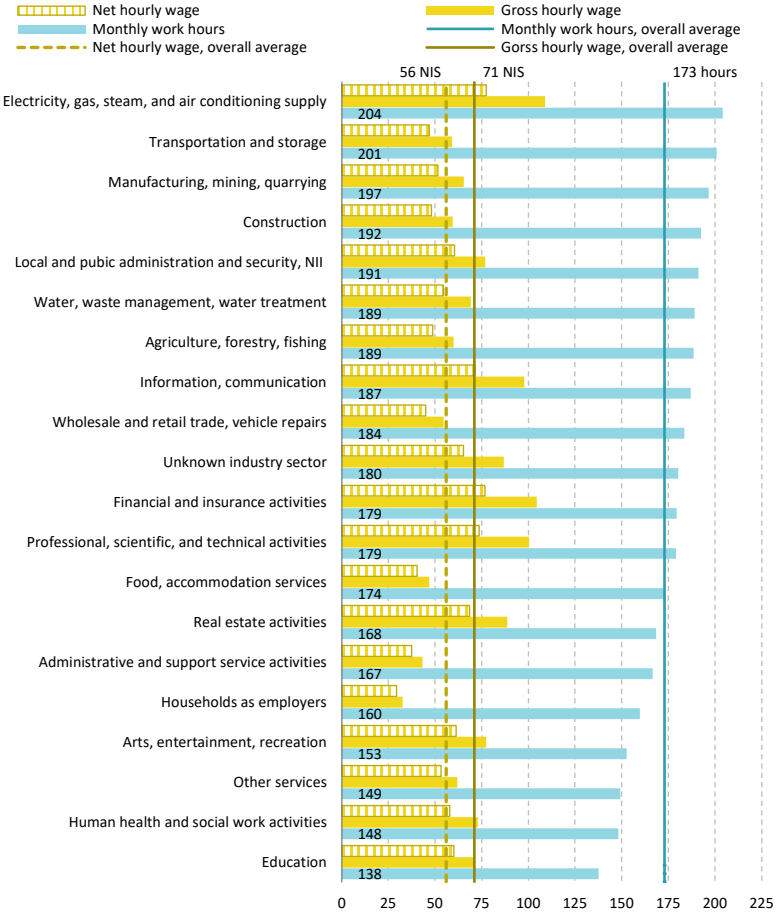


Source: Michael Debowy, Gil Epstein, and Avi Weiss, Taub Center | Data: CBS

In a breakdown by industry and occupation, there is, perhaps unsurprisingly, significant variability in work hours across different vocations, which does not always align with wage differences. Figure 7 shows the average number of work hours and the average hourly wage (gross and net) by industry. Workers in construction, administration and security, manufacturing, mining and quarrying, and infrastructure industries tend to work 10%–18% more hours than the national average, and wages in some of those industries are below average, while in others, they are above. The breakdown by occupation (Figure 8) presents a similar picture: there are occupations in which individuals tend to work more than the average, whether the wage is above (managers) or below the average (plant and machine operators), and there are occupations in which people tend to work less, whether the wage is high (professionals) or low (sales and service workers).

Figure 7. Average monthly work hours and hourly wage, selected industries

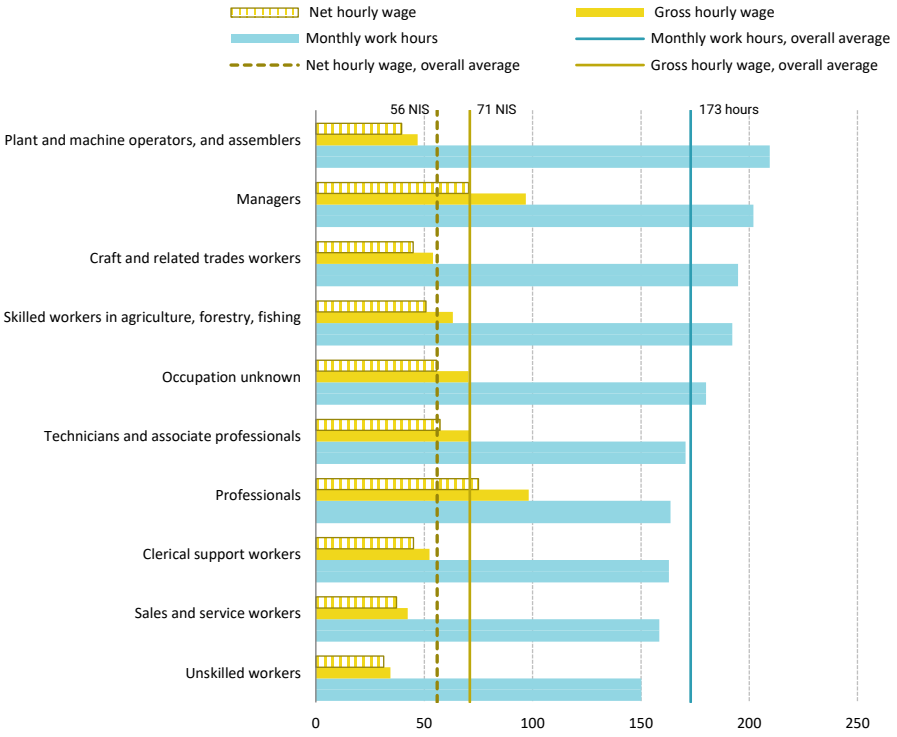
NIS, 2019 prices



Source: Michael Debowy, Gil Epstein, and Avi Weiss, Taub Center | Data: CBS

Figure 8. Average monthly work hours and hourly wage, by occupation, 2014–2019

NIS, 2019 prices



Source: Michael Debowy, Gil Epstein, and Avi Weiss, Taub Center | Data: CBS

Based on the descriptive statistics, it appears that the relationship between wages and work hours in Israel is not well explained by occupation or industry and only partially explained by education. Gender, sector, and age have greater explanatory power. In estimating employment elasticity, we will use these factors to characterize the prevailing wage offered to workers in the labor market and estimate its impact (alongside the number of children in the household) on the number of work hours.

Employment elasticity with respect to wages and the number of children in the household[4]

The challenge in estimating employment elasticity arises from the fact that, although wages affect work hours, work hours simultaneously may also affect wages (with other factors, such as age and education, affecting both at the same time). To estimate the elasticity of work hours with respect to wages, it is necessary to isolate the direction of the effect. To this end, we use the prevailing wage as an instrument for the individual's wage, where the prevailing wage is the average wage that workers with the individual's specific characteristics receive in the labor market.[5,6] Since the prevailing wage is also determined by age, region, gender, and education, we control for these variables when estimating the elasticity of employment and work hours with respect to

4 Due to data limitations, it is not possible to accurately attribute a specific number of children of a certain age to each individual in the sample. Therefore, we used the number of children under the age of 10 living in the household as a proxy variable for parents with young children. As a result, young people (aged 25 or more) living with their parents alongside siblings up to the age of 9 are classified as "*parents*"; however, we assume that such cases are rare and randomly distributed. In previous research (Debowy et al., 2021), this variable was shown to have predictive power for employment (especially in the case of women), which confirms its relevance to some extent.

5 Formally, for each individual *i* we define the set S_i as all the other individuals in the sample who are working (regardless of whether individual *i* works or not) in the same year t_i, live in the same geographic district g_i, belong to the same gender m_i, have the same level of education s_i and are no more than 5 years older or younger than the individual:

$$S_i = \{j \neq i | \, t_j = t_i,\, m_j = m_i, s_j = s_i,\, g_j = g_i, a_i - 5 \leq a_j \leq a_i + 5\}$$

The prevailing wage for individual *i* is the average wage of the individuals in set S_i:

$$Prevailing\ Wage_i = \frac{1}{|S_i|} \sum_{j \in S_i} Wage_j$$

6 There is a concern that due to each individual's small contribution to the equilibrium in the labor market, the *prevailing wage* calculated for them will be related to their unobservable characteristics, which would bias the estimate. Given the size of the groups on which the prevailing wage for each individual in the sample is calculated (see Appendix Table 1), it is likely that this bias is negligible. To achieve greater confidence, we conducted several estimations in which all individuals in the sample with less than a hundred working men and women (excluding the individual himself if he works) in the group from which the prevailing wage is derived were omitted. Moreover, we repeated the estimation for various age ranges used to define the *prevailing wage*. None of these robustness checks significantly affected the results (see Appendix Table 3 and 4).

wages.[7] The estimation is conducted using a two-stage model, which estimates the impact of the instrumental variables on the explanatory variables (wages or parenthood) in the first stage while in the second stage it estimates the impact of the explanatory variables on the dependent variable (employment or work hours) using predictions from the first stage.[8] A description of the methodology and the full estimation results are presented in the Appendix.

The estimation shows that employment elasticity with respect to wages is about 0.25 for men and about 0.31 for women, and the elasticity of work hours is about 0.45 for men and 0.56 for women. These results broadly match the upper range of estimates found in the literature and are consistent with past estimates of labor supply elasticity in Israel (though not with the findings of Ben-Zeev and Shai, 2017 who found no evidence of any employment elasticity). However, there is considerable variability between men and women from various population groups, as presented in Table 1 below.

Table 1. Labor elasticity and work hours relative to net wage, by sector and gender, 2014–2019

	Total		Non-Haredi Jews		Arabs		Haredim	
	Men	Women	Men	Women	Men	Women	Men	Women
Employment	0.25***	0.31***	0.16***	0.22***	0.09***	0.14***	0.15***	0.15***
	(0.013)	(0.009)	(0.012)	(0.011)	(0.004)	(0.007)	(0.014)	(0.008)
Work hours	0.45***	0.56***	0.43***	0.53***	0.31***	0.39***	0.52***	0.57***
	(0.072)	(0.061)	(0.082)	(0.074)	(0.079)	(0.080)	(0.070)	(0.067)

Note: The table presents the estimated effect (from the 2SLS model) of a 1% increase in wages on the probability of the individual working (in percentage points) and on his work hours (in percentages) if he is employed. Standard errors appear in parentheses below the estimate. The estimates were obtained by calculating the average marginal effects in the models whose findings are presented in columns (2) and (4) of Appendix Table 3 (work hours) and columns (1) and (2) of Appendix Table 4 (employment).

Significance levels: *p < 0.10; **p < 0.05; ***p < 0.01.

Source: Michael Debowy, Gil Epstein, and Avi Weiss, Taub Center | Data: CBS

7 We also control for the spouse's wage (using their *prevailing wage* as an instrumental variable) in order to avoid bias stemming from the correlation of wages and employment within a couple (Bredemeier & Juessen, 2013).

8 In the case of work hours, we carried out the estimation using the two-stage least squares (2SLS) method, and in the case of employment, we used the Probit method with a parallel preliminary stage.

Table 1 shows, for example, that among both Arab men and Arab women, the elasticity of employment and work hours is on average lower than the elasticity among Jews: Arab men have an employment elasticity of 0.09 (compared to 0.16 among non-Haredi Jews) and a work hour elasticity of 0.31 (compared to 0.43), while Arab women have an employment elasticity of 0.14 (compared to 0.22 among non-Haredi Jewish women) and a work hour elasticity of 0.39 (compared to 0.53). Among Haredi men and women, employment elasticity is slightly lower than that of their non-Haredi Jewish counterparts, and there is no significant difference in employment and work hour elasticity between men and women in this population group.

In a similar manner, we also estimated the effect of having young children under the age of 10 in the household (as a proxy variable for being a parent). This estimation presented similar challenges to those in estimating elasticity with respect to wages, and the identification method used was also similar. Analogous to the calculation of the prevailing wage calculated for each individual based on the wages of other similar individuals, we calculated the normative family size for each individual based on other similar individuals. This variable crudely represents the cultural norms regarding desired family size to which the individual is exposed.[9] The results are presented in Table 2.

As shown in the table, and in the context of the population as a whole, it is clear that only women are affected by the number of children at home, with each additional child decreasing the likelihood that a mother will work by 3 percentage points and reducing her work hours — if she works — by about 13% on average. Nonetheless, there is a great deal of variation across population groups: in terms of employment, non-Haredi Jewish women have an elasticity of-0.06, which is twice that of Arab women, while the employment of Haredi Jewish women does not seem to affected by the presence of children.

9 Formally, for each individual i we define the set S_i as all the other individuals in the sample who belong to the same gender m_i, have the same ethnicity and level of religiosity I_i and are no more than 5 years older or younger than the individual:

$$S_i = \{j \neq i |\ m_j = m_i,\ I_j = I_i, a_i - 5 \leq a_j \leq a_i + 5\}$$

The prevailing wage for individual i is the average wage of the individuals in set S_i:

$$Normative\ Family\ Size_i = \frac{1}{|S_i|} \sum_{j \in S_i} Family\ Size_j$$

In contrast, in terms of work hours, Haredi women have a work hour elasticity of about -0.09 (which is similar to non-Haredi Jewish women), while Arab women have a much higher elasticity of -0.25. In other words, while working women from all sectors are expected to reduce their work hours with each additional child at home, the reduction is greater among Arab women.

Table 2. The effect of the number of children in the household on work hours and employment, by sector and gender, 2014–2019

	Total		Non-Haredi Jews		Arabs		Haredim	
	Men	Women	Men	Women	Men	Women	Men	Women
Employment	-0.07	-0.03***	0.08**	-0.06***	0.05***	0.03***	-0.04***	0.001
	(0.093)	(0.007)	(0.011)	(0.009)	(0.006)	(0.006)	(0.008)	(0.004)
Work hours	-0.01	-0.13***	0.04	-0.11***	0.07***	-0.25***	-0.09***	-0.09***
	(0.010)	(0.012)	(0.029)	(0.009)	(0.017)	(0.060)	(0.012)	(0.027)

Note: The table presents the estimated effect (from the 2SLS model) of the birth of an additional child on the probability of the individual working (in percentage points) and on his work hours (in percentages) if he is employed. Standard errors appear in parentheses below the estimate. The estimates were calculated using the average marginal effects in the models whose findings are presented in columns (2) and (4) of Appendix Table 3 (work hours) and columns (1) and (2) of Appendix Table 4 (employment).

Significance levels: *p < 0.10; **p < 0.05; ***p < 0.01.

Source: Michael Debowy, Gil Epstein, and Avi Weiss, Taub Center | Data: CBS

In addition, the negligible elasticity of the labor supply among men in the overall population conceals elasticities in the opposite directions in different sectors. In contrast to women, non-Haredi men (Jewish, Arab, and others) are expected to be employed with a higher likelihood as the number of children increases. Among Haredi men, the effect is the opposite: their likelihood of being employed decreases as the number of children in the household increases. Similarly, working Haredi men are expected to reduce their work hours with each additional child at home, as observed among Haredi women.

Overall, the findings indicate significant heterogeneity in the Israeli labor market. The labor supply of men and women increases significantly with the wage offered to them, and the effect on women is greater than that on men among non-Haredi individuals, and smaller among Arabs than among Jews. The presence of children at home has a negative effect on the labor supply of women from all sectors and on Haredi men, and a small positive effect on the employment likelihood of non-Haredi Jewish and Arab men.

Policy implications

The elasticity of the labor supply with respect to wages sheds light on the reactions of individuals to changes in the labor market, apart from the effect of a change in wages per se. For example, one could test the impact of growth in labor productivity or a modification in tax policy on labor supply, and even how a change in the exchange rate, which affects real wages, would affect labor supply. Estimates of the impact of parenting on employment and wages allow an analysis of the effects of potential policy changes — with an emphasis on early childhood education and subsidies for after-school programs and daycare — on the labor market. These estimates can be used in combination to examine issues such as the impact of changes in tax credit points for parents on employment and on tax revenues, or the potential implications of some other change in the taxation of labor income. We will present two examples of policy implications, based on simplifying assumptions.

Income tax rate

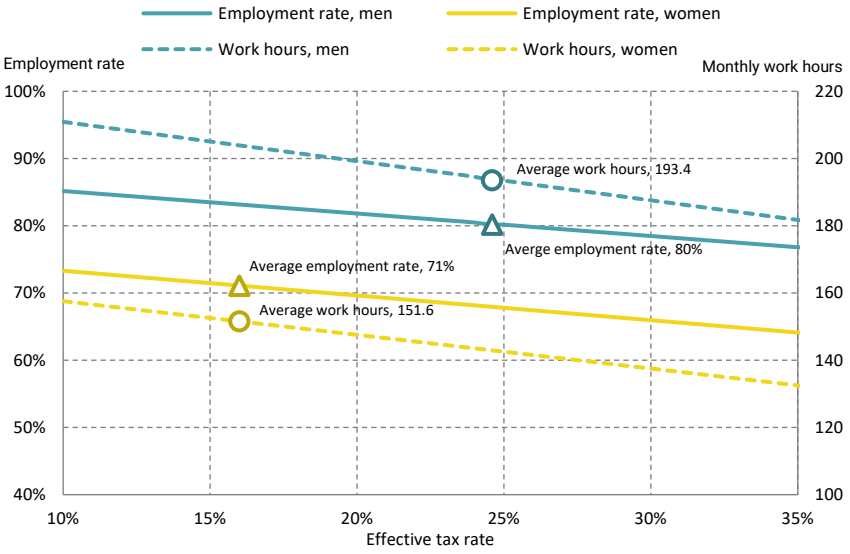
We examined how changes in the effective tax rate on wages (the difference between gross wages and net wages as a percentage of gross wages) are expected to affect employment and work hours, and, as a result, the wage base and tax revenues. It is worth emphasizing that these are theoretical changes in the average effective tax rate, without an exact scenario specifying specific changes in tax brackets.[10]

Such an analysis is based on the assumption that the income tax rate affects real wages and thereby labor supply, such that a change in the effective tax rate imposed on the individual directly affects net wages. We assume that individuals react to the change in net wages according to the elasticities presented in Table 1 (in the general population, by gender). We also assume that these expected changes in labor supply will not affect gross wages, an assumption whose likelihood decreases as the changes in employment and work hours become larger. For minor changes, it is possible that the impact of the change in labor supply on wages will indeed be negligible.

10 This analysis relates to the income tax as a factor that exogenously increases or decreases net wages; in fact, this can apply to any tax or other factor that operates in this way, such as VAT — a tax whose effective rate is much more uniform across workers.

Figure 9 presents the expected average number of work hours and the employment rate for men and women for different levels of the effective income tax rate. The graph is based on the estimated linear elasticities and therefore implies that reducing the tax burden — and effectively increasing wages — will increase labor supply at every level. This forecast is unlikely to be realistic, and it is possible that beyond a certain level, the response of labor supply to wages will reverse (for example, if net wages decline significantly, it may be that the number of work hours will increase in order to cover basic living expenses, a phenomenon known as the backward-bending supply curve). However, our attempt to estimate non-linear elasticity did not yield statistically significant results, and, therefore, we remained with the linear approximation as presented, with the understanding that this estimate is likely only suitable for a range of the effective tax rate relatively close to its average level in the sample.

Figure 9. Labor supply and the effective income tax rate, by gender, 2014–2019 average



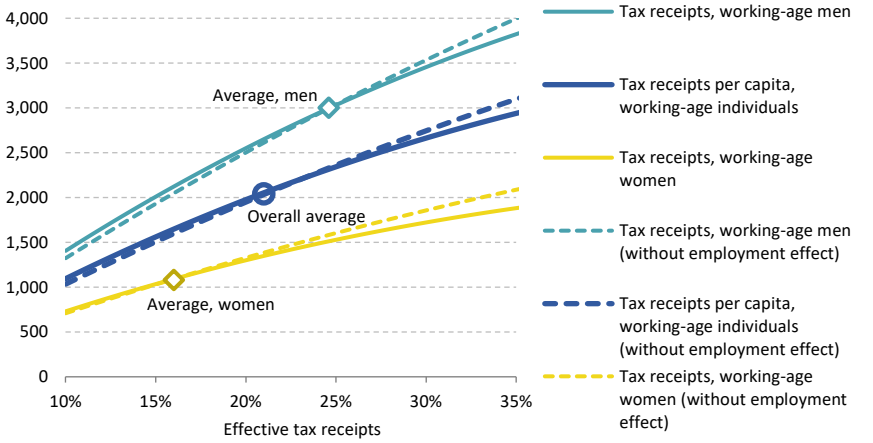
Source: Michael Debowy, Gil Epstein, and Avi Weiss, Taub Center | Data: CBS

This analysis — combined with the sample wage data — can also be used to roughly estimate the effect of the effective tax rate on the total tax revenue from labor income. Such an analysis combines the two directions of the tax change's impact on tax revenue: it collects a larger portion of workers' total wages (which increases tax revenues), while reducing their labor supply — and therefore also the wage base on which the tax is imposed — in response to the decrease in net wages (which shrinks tax revenues).

Figure 10 presents the monthly tax revenue per capita of working-age individuals according to the effective tax rate. In order to calculate the tax revenue, we multiplied the average number of work hours per capita of working-age individuals (the employment rate multiplied by the number of work hours from Figure 9) by the effective tax rate and the average gross wage (under the assumption that the gross wage remains constant). This analysis requires certain assumptions about the work hours and wages of individuals entering or leaving the labor market for each change in taxation. We present two scenarios in this context: in the baseline scenario, the individuals are identical in terms of their work hour elasticity to those who were (or will continue to be) employed before or after the change; in the alternative scenario, these individuals do not pay tax at all and therefore their employment has no significance when calculating the tax. The difference between the two scenarios is not significant quantitatively, and the complete omission of the employment effect from the calculation does not significantly affect the results (due to, among other reasons, very high employment rates to begin with and low employment elasticity relative to work hour elasticity).

Figure 10. Effective tax rate and per capita tax revenue for working age individuals, 2014–2019

NIS, 2019 prices



Note: The lines in the graph represent the monthly tax revenue per capita of working-age individuals according to the effective tax rate (the product of work hours, the employment rate, the tax rate from Figure 9, and the average hourly gross wage). The dashed lines represent the same tax revenue under the assumption that the employment rate remains unchanged. In general, the graph presents the left hand side of the Laffer Curve for the Israeli labor market; the curve represents tax revenue as a function of the tax rate (for more details, see Laffer, 2004; Gahvari, 1989).

Source: Michael Debowy, Gil Epstein, and Avi Weiss, Taub Center | Data: CBS

The figures show that within the range of the effective tax rate currently imposed on wages, an increase in the tax burden is expected only to increase revenues. That is, the increase is not expected to adversely affect the labor supply to an extent that would ultimately harm tax revenues. For example, an increase in the average effective tax rate of 4 percentage points is expected to reduce the employment rates of men and women by only 1.3 and 1.5 percentage points (respectively) and average work hours by only 2.4% and 2.6% (respectively). Thus, tax revenue will increase by 17% (about NIS 340 per working-age individual or slightly less than NIS 1.4 billion per month). These findings suggest that it is possible to increase the income tax rate moderately without broadly reducing the overall labor supply.

Early childhood education and care frameworks

As presented above, the analysis also confirms the negative correlation between motherhood and work as documented in depth by Shachar (2012) and Yakin et al. (2021), even given other background factors that affect wages and fertility. A working non-Haredi Jewish mother of three children is expected to work 39% fewer hours than a similar female worker without children; a Haredi Jewish woman or man about 27% less; and an Arab woman about 75% less. This is in addition to an expected decline in the likelihood of working at all with each additional child in the household, which ranges from 3 to 6 percentage points across the various population groups.

These findings are in line with the claim that parenting constraints — often in combination with gender norms — hinder a mother's integration into the labor market, both in terms of employment and work hours. This relates to the oft-heard argument in favor of expanding subsidies for early childhood education and care and even legislation to introduce free education from birth, where part of the cost of these measures may be offset by increased employment among mothers. It is uncertain what portion of the effect we measured would disappear given access to free education from birth, but assuming such legislation would completely negate the impact of children's presence on employment, the model predicts a 7 percentage point increase in women's employment rate and a 29% increase in the average number of work hours among those who were already working — almost enough to entirely eliminate the gender work gap.[11] While this assumption represents an upper limit, past research indicates that access to early childhood education frameworks significantly increases the labor supply of mothers, suggesting that free education is likely to bear fruit in terms of women's integration into the labor market, even if they do not completely catch up to men.

Similarly, a rough estimate of the short-term economic benefit of such a policy can be calculated in terms of tax revenue from labor income, under a number of facilitating assumptions: working mothers will continue to earn the same wage

11 The figures were obtained by multiplying the general elasticities for women (second column from the right in Table 2) by the average number of children per household in the sample, i.e., 2.2 children per woman. This number is almost identical to the product of the total fertility rate in the relevant years (3.07) and the proportion of working women in the sample under age 50 (70%).

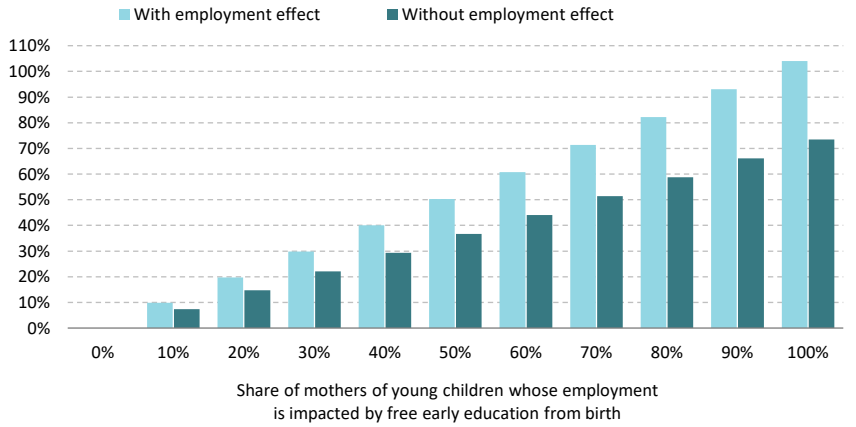
(in hourly terms) and pay the same average tax on their wages,[12] and mothers who join the workforce will work to a similar extent and for a similar wage as the working mothers in the sample. Assuming that such a policy will eliminate all the effects of parenthood found for women in the general population, free education from birth will increase the monthly tax revenue per working-age woman by about NIS 440, and the total monthly tax revenue by about NIS 880 million.[13] This amounts to about NIS 10.6 billion per year — an impressive sum in view of the expected annual cost of NIS 10 billion to operate the daycare centers (alongside a one-time investment of somewhat more than NIS 17 billion to build new daycare centers).[14] This calculation is, as mentioned, based on the assumption that free education from birth will eliminate all the labor-market effects of parenthood found for women — a far-reaching assumption, at the very least. Figure 11 discards this assumption and examines the economic benefit of free education (as a percentage of the expected operating costs) under a continuum of alternative assumptions regarding the percentage of the parenthood effect that will be affected by the policy. The figure shows that even under the most lenient assumption, i.e., that non-working mothers will work at rates identical to working mothers, only if the entire motherhood effect disappears as a result of access to free education from birth will the policy fully cover operating costs. In contrast, under the stricter assumption that mothers joining the workforce will not pay taxes at all, the expected increase in tax revenues will cover at most 73% of the operating costs.

12 The assumption that mothers would earn similar wages is actually conservative relative to the evidence that shows an increase in mothers' wages resulting from subsidies to early childhood education facilities (see Shachar, 2021).

13 The aggregate tax revenue was calculated by multiplying the tax revenue per working-age woman by the average size of the relevant female population in Israel during the sample years, which was about 2 million women.

14 Kaplinsky and Kuprak (2020) estimate annual operating costs of NIS 8 billion and a one-time construction cost of just under NIS 14 billion, under the assumption that about 425,000 children aged 0 to 3 would be added to the system. Given the actual number of children in this age group during the sample years (on average) according to the Central Bureau of Statistics data, i.e. about 540,000, we inflated the costs calculated by Kaplinsky and Kuprak by 27%.

Figure 11. Free education and care from birth: Economic benefit as a percent of expected cost, by elasticity rate affected by the move, 2014–2019



Note: The graph shows the economic benefit of free education from birth as a percentage of the expected operating costs (NIS 10 billion according to the adjustment to the estimate made by Kaplinsky and Kuprak [2020] for the size of the relevant infant population during the sample years), under various assumptions about the relationship between the noted effect of parenthood among women and access to free early childhood education frameworks.

Source: Michael Debowy, Gil Epstein, and Avi Weiss, Taub Center | Data: CBS; Kaplinsky and Kuprak, 2020

In parallel to an aggregate economic analysis of the effects of access to early childhood education and care frameworks on workers in general, it is worthwhile focusing on the two populations with the lowest employment rates in the labor market: Arab women and Haredi men. As noted, these two populations are particularly sensitive to the presence of children in the household: Arab women show the greatest (negative) work hour elasticity, and Haredi men exhibit similar work hour elasticity but greater (negative) employment elasticity, and in fact are the only male population whose labor supply is negatively affected by fatherhood. Regarding the first group, Schlosser (2011) has already demonstrated the beneficial effect of access to early childhood education and care frameworks on the labor supply of Arab women, especially among the educated ones (whose employment rate and work hours are already higher on average). As for the second group, their employment rates and work hours (which are also much higher among those with higher

levels of education) may significantly increase if there are additional subsidies for their children's education, given that this sector typically has a larger number of children.

Conclusion

This study has shown that between 2014 and 2019, Israeli workers worked an average of about 173 hours per month. We presented the association between work hours and wages without control variables, and the association between each of them and other factors, such as age, gender, sector, and education. We showed that employment and work hours increase until the age of 45–50, while wages increase until the age of 55–60, and that a breakdown according to occupation or industry explains only a part of the association between work hours and wages.

We also addressed differences between population groups and showed that, among the employed, non-Haredi Jewish men and Arab men worked more hours than the overall average, while Haredi men worked less. Furthermore, we showed that, among the employed, women across all population groups work fewer hours than the overall average, with non-Haredi Jewish women having the highest number of work hours and Haredi women the lowest. We demonstrated that there is a correlation between having an academic education and work hours, and that it is relatively small in the general population but increases by 6–12 fold among Haredi men and Arab women, the weakest populations in terms of integration in the labor market.

We then presented estimates of the elasticity of labor supply with respect to wages and the number of children in the household. With regard to wages, we estimated an employment elasticity of 0.25 for men and 0.31 for women, and a work hour elasticity of 0.45 and 0.56, respectively. With respect to the number of children in the household, we showed that each additional child reduces the mother's likelihood of being employed by 3 percentage points and her work hours (if she is employed) by 13%. In the general population, the number of children in the household was not found to have any effect on men's labor supply.

However, significant variation in labor elasticity was found across population groups. Thus, labor elasticity with respect to wages is lower among non-Haredi Jewish men and Arab men compared to women from these groups, and the

elasticity is similar between the genders in the Haredi sector. Furthermore, the labor elasticity of Arabs, both men and women, is lower than that of Jews. Regarding the effect of the number of children in the household on labor supply, we found that Arab women reduce their work hours to a greater extent than Jewish women as the number of children increases; the likelihood of being employed increases among non-Haredi Jewish men and Arab men for each additional child (in contrast to women in these populations); and the likelihood of being employed and number of work hours (for the employed) decrease among Haredi men with each additional child.

Finally, we presented two examples of policy implications, using the estimated employment and work hour elasticities along with the averages of other variables in the sample. We examined labor supply and the effective income tax rate — under the assumption that a change in the tax rate is equivalent to a change in net wages — and found that, at least in the short term, and relative to the sample tax rate, a moderate tax increase is unlikely to reduce labor supply in a way that ultimately harms tax revenue. In fact, the analysis shows that it is possible to significantly increase tax revenues by raising the tax rate. We also examined the expected impact of free early childhood education and care from birth on women's labor supply and on tax revenue under various assumptions. The analysis suggested that such a move could, at least in theory, significantly reduce gender disparities in employment and work hours and even increase tax revenues in a way that finances part of the education programs' operating costs.

These examples should be treated with caution, since they are based on various assumptions linking the elasticity of labor supply, as estimated in this study, to very specific factors in the lives of workers that we were not able to definitively identify in the data. To conduct analyses with more predictive power and statistical accuracy, it would be necessary to collect relevant data over time and to track various elements (such as changes in the tax rate or access to early childhood education and care) more precisely. Nonetheless, the study corroborates the general assertion that wage gaps and differences in the burden of childrearing play a central role in gender labor gaps — as demonstrated by previous studies in Israel and in other countries — and it is likely that measures to reduce these gaps will increase labor supply in Israel, along with growth and living standards.

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Appendix

Identification and the estimation results

To assess the impact of wages and number of children in the household on work hours and employment, we used instrumental variables in a two-stage least squares model.[15] The instrumental variables are designed to capture exogenous factors that affect either wages or the number of children in the household in a way that is not determined by the individual. The instrumental variables are technically similar to each other but differ in nature.

For an individual's wage, we calculated the prevailing wage as the average wage in a given year for individuals of the same gender and age group who reside in the same region and have the same level of education (academic or otherwise). This variable is intended to capture the component of the individual's wage that is the result of the equilibrium in the relevant labor market, independent of the worker's personal characteristics. For number of children in the household, we calculated normative family size, which is the average number of children for individuals of similar age belonging to the same gender-ethnicity-religiosity group. Formally, these instrumental variables are calculated based on the following formula:

(1) $$z_i = \frac{1}{|S_i|}\sum_{j \in S_i} x_j$$

where z is the instrumental variable for individual i with background factors m_i (in the case of wages, this includes gender, region, education level, and year, and in the case of number of children this includes gender and ethnicity and level of religiosity) at age a_i, x is the endogenous variable (either the individual's wage or number of children in the household) and $|S_i|$ is the number of individuals in the set of those similar to individual i,

$$S_i = \{j \neq i |\ m_j = m_i, a_i - 5 \leq a_j \leq a_i + 5\}$$

These instrumental variables in practice suffer from a weakness derived from the theoretical rationale underlying them. Specifically, since it is assumed that an individual is influenced by a peer group consisting of similar individuals, that individual is also a member of that peer group, thereby actually influencing

15 In practice, this involve 2SLS estimation for work hours and IV-Probit estimation (in which the second stage is a Probit model) for employment.

himself and undermining the assumption of exogeneity. We assume this effect is negligible when n_i is sufficiently large (i.e., when the individual has a very small effect on the equilibrium in the labor market and on the cultural norms that influence family size). We examine the sensitivity of the results to changes in the distribution of n_i by changing the age ranges that define the peer groups (thereby also testing the sensitivity of the results to the arbitrary age range used in the base model) and by excluding individuals for whom the peer groups consist of fewer than 100 other individuals (for the estimated results in these cases, see columns 3, 5, and 6 in Appendix Table 3 and columns 3 and 4 in Appendix Table 4). Descriptive statistics for the distribution of n_i in the base model and under different age ranges when defining peer groups are presented in Appendix Table 1.

Appendix Table 1. Number of individuals per IV group, by IV group and age range used to define the group

Explanatory variable	Net hourly wage			Children under age 10 in household		
Instrumental variable	*Prevailing wage*			*Normative family size*		
Age range for calculation of instrumental variable	±3	±5	±7	±3	±5	±7
Smallest peer group	8	13	18	25	38	50
Median peer group	98	150	201	1,026	1,557	2,090
Mean peer group	104.9	160.8	213.6	1,142.1	1749.0	2,323.1
Largest peer group	290	430	556	2,711	4,156	5,497

Source: Michael Debowy, Gil Epstein, and Avi Weiss, Taub Center | Data: CBS

After calculating the instrumental variables, we proceed with the estimation using the two-stage least squares (2SLS) method. The estimation equations are as follows:

(2.1) $$X_i^{'} = \mu + \boldsymbol{A}'Z_i^{'} + \vartheta M_i^{'} + \omega_i$$

(2.2) $$y_i = \alpha + \beta\hat{X}_i^{'} + \gamma M_i^{'} + \varepsilon_i$$

where X_i' is a vector of the endogenous variables (the individual's wage, the spouse's wage, and the number of children in the household, in interaction with gender and/or sector) for individual *i*; Z_i' is a corresponding vector of instrumental variables as calculated from the various versions of equation (1) (in interaction with gender and/or sector); M_i' is a vector of background variables including age-gender, education-gender, region of residence and ethnicity-religiosity; $\hat{X}_i'$ is a vector of the predicted values of X_i' based on the estimation of equation (2.1); and y_i is the outcome variable, namely individual *i*'s work hours or employment.[16]

Appendix Table 2 presents the results of the first stage, as estimated from equation (2.1) in a number of versions.[17] Panels A and C (the two leftmost columns) present the estimated impact of the instrumental variables on wages and the number of children by gender only, while Panels B and D present estimates according to both gender and sector. The upper panels (A and B) — which show the first stage in estimating the elasticity of work hours — include only the employed, while Panels C and D — which present the first stage in estimating employment elasticity — are based on the entire sample. The results of the first stage are highly significant, and the diagonal in the table (the cells where the relevant instrumental variable estimate is presented) contains estimates that are significant at the 1% level at least. Finally, the F-statistic of each regression is greater than 10 and significant. We can therefore conclude that the instrumental variables are relevant and strong.

16 As mentioned, equation (2.1) for employment will be the following Probit model:
$$P(y_i = 1|\hat{X}_i^{'}, M_i^{'}) = \Phi(\alpha + \beta\hat{X}_i^{'} + \gamma M_i^{'})$$

17 Panels A and B of Appendix Table 2 represent the first stage of the model, the second stage of which is presented in columns (2) and (4) of Appendix Table 3, while Panels C and D of Appendix Table 2 correspond to columns (1) and (2) of Appendix Table 4.

Appendix Table 2. Results of the first stage, the effect of prevailing wage and normative family size on hourly wage and the number of children in the household

Dependent variables / Explanatory variable	Panel A		Panel B					
	Log hourly wage X male	Log hourly wage X female	Log hourly wage X male X non-Haredi Jew or Other	Log hourly wage X female X non-Haredi Jew or Other	Log hourly wage X male X Arab	Log hourly wage X female X Arab	Log hourly wage X male X Haredi	Log hourly wage X female X Haredi
Log of prevailing wage X male	0.569***	-0.216						
	(0.048)	(0.04)						
Log of prevailing wage X female	-0.221	0.599***						
	(0.042)	(0.077)						
Log of prevailing wage X male X non-Haredi Jew or Other			0.61***	-0.201	-0.042	-0.021	-0.020	-0.012
			(0.034)	(0.038)	(0.013)	(0.004)	(0.003)	(0.003)
Log of prevailing wage X female X non-Haredi Jew or Other			-0.184	0.588***	-0.014	-0.015	-0.003	-0.017
			(0.031)	(0.076)	(0.011)	(0.004)	(0.004)	(0.004)
Log of prevailing wage X male X Arab			-0.226	-0.099	0.73***	0.018*	-0.019	-0.012
			(0.019)	(0.016)	(0.026)	(0.01)	(0.004)	(0.003)
Log of prevailing wage X female X Arab			-0.059	-0.268	-0.164	0.952***	-0.001	-0.017
			(0.02)	(0.048)	(0.021)	(0.012)	(0.005)	(0.004)
Log of prevailing wage X male X Haredi			-0.241	-0.090	-0.046	-0.022	0.754***	-0.052
			(0.025)	(0.01)	(0.013)	(0.004)	(0.023)	(0.025)
Log of prevailing wage X female X Haredi			-0.075	-0.253	-0.016	-0.016	-0.160	0.91***
			(0.023)	(0.046)	(0.011)	(0.004)	(0.024)	(0.028)
Additional variables: prevailing wage of spouse, gender, education, ethnicity-level of observance, age-gender, geographic district, intercept	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Appendix Table 2 (continued). Results of the first stage, the effect of prevailing wage and normative family size on hourly wage and the number of children in the household

Dependent variable / Explanatory variable	Panel A		Panel B					
	Log hourly wage X male	Log hourly wage X female	Log hourly wage X male X non-Haredi Jew or Other	Log hourly wage X female X non-Haredi Jew or Other	Log hourly wage X male X Arab	Log hourly wage X female X Arab	Log hourly wage X male X Haredi	Log hourly wage X female X Haredi
Additional variables: normative family size X gender	Yes	Yes	No	No	No	No	No	No
Additional variables: normative family size X gender X sector	No	No	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.96	0.96	0.97	0.97	0.98	0.98	0.98	0.98
F	371.15	18.58	152.88	15.93	4,800.94	21.56	8,261.16	17.35
(p value)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)

Appendix Table 2 (continued). Results of the first stage, the effect of prevailing wage and normative family size on hourly wage and the number of children in the household

Number of observations	48,451	48,451	48,451	48,451	48,451	48,451	48,451	48,451
Dependent variable / Explanatory variable	Panel A (continued)		Panel B (continued)					
	Number of children X male	Number of children X female	Number of children X male X non-Haredi Jew or Other	Number of children X female X non-Haredi Jew or Other	Number of children X male X Arab	Number of children X female X Arab	Number of children X male X Haredi	Number of children X female X Haredi
Normative family size X male	1.157***	0.062***						
	(0.039)	(0.006)						
Normative family size X female	0.082***	1.139***						
	(0.007)	(0.044)						
Normative family size X male X non-Haredi Jew or Other			1.33***	0.061***	0.019**	-0.003	0.005**	0.002
			(0.06)	(0.008)	(0.007)	(0.001)	(0.002)	(0.003)
Normative family size X female X non-Haredi Jew or Other			0.044***	1.257***	0.006*	-0.004	0.001	0.003
			(0.005)	(0.07)	(0.003)	(0.001)	(0.002)	(0.002)
Normative family size X male X Arab			0.145***	0.03*	1.273***	0.029***	0.005*	0.002
			(0.017)	(0.017)	(0.064)	(0.007)	(0.003)	(0.004)
Normative family size X female X Arab			0.006	0.226***	0.046***	0.806***	0.000	0.002
			(0.006)	(0.022)	(0.011)	(0.036)	(0.001)	(0.002)
Normative family size X male X Haredi			0.067***	0.001	0.009**	-0.002	0.967***	0.005
			(0.009)	(0.004)	(0.004)	(0.001)	(0.04)	(0.008)
Normative family size X female X Haredi			0.006**	0.113***	0.003*	-0.002	0.011***	1.01***
			(0.003)	(0.011)	(0.002)	(0.001)	(0.003)	(0.034)

Appendix Table 2 (continued). Results of the first stage, the effect of prevailing wage and normative family size on hourly wage and the number of children in the household

Additional variables: prevailing wage of spouse, gender, education, ethnicity-level of observance, age-gender, geographic district, intercept	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dependent variable	**Panel A**		**Panel B**					
Explanatory variable	**Number of children X male**	**Number of children X female**	**Number of children X male X non-Haredi Jew or Other**	**Number of children X female X non-Haredi Jew or Other**	**Number of children X male X Arab**	**Number of children X female X Arab**	**Number of children X male X Haredi**	**Number of children X female X Haredi**
Additional variables: prevailing wage X gender	Yes	Yes	No	No	No	No	No	No
Additional variables: prevailing wage X gender X sector	No	No	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.41	0.45	0.41	0.39	0.34	0.31	0.67	0.70
F	41.23	329.88	210.38	184.6	980.16	208.22	550.9	533.35
(p value)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Number of observations	48,451	48,451	48,451	48,451	48,451	48,451	48,451	48,451

Appendix Table 2 (continued). Results of the first stage, the effect of prevailing wage and normative family size on hourly wage and the number of children in the household

Dependent variable / Explanatory variable	Panel C		Panel D					
	Log of prevailing wage X male	Log of prevailing wage X female	Log of prevailing wage X male X non-Haredi Jew or Other	Log of prevailing wage X female X non-Haredi Jew or Other	Log of prevailing wage X male X Arab	Log of prevailing wage X female X Arab	Log of prevailing wage X male X Haredi	Log of prevailing wage X female X Haredi
Log of prevailing wage X male	1.313***	-0.295***						
	(0.033)	(0.021)						
Log of prevailing wage X female	-0.080***	1.466***						
	(0.023)	(0.033)						
Log of prevailing wage X male X non-Haredi Jew or Other			1.109***	-0.029	0.042***	-0.207***	-0.002	-0.081***
			(0.030)	(0.018)	(0.010)	(0.009)	(0.008)	(0.008)
Log of prevailing wage X female X non-Haredi Jew or Other			-0.015	1.103***	-0.015	-0.004	-0.028***	-0.022**
			(0.019)	(0.032)	(0.011)	(0.009)	(0.007)	(0.007)
Log of prevailing wage X male X Arab			0.171***	-0.226***	0.814***	0.641***	0.003	-0.073***
			(0.021)	(0.020)	(0.041)	(0.035)	(0.008)	(0.007)
Log of prevailing wage X female X Arab			-0.155***	0.131***	0.124***	1.366***	-0.023***	-0.010
			(0.020)	(0.021)	(0.032)	(0.047)	(0.007)	(0.006)
Log of prevailing wage X male X Haredi			0.147***	-0.203***	0.032***	-0.213***	0.973***	0.423***
			(0.020)	(0.021)	(0.009)	(0.010)	(0.069)	(0.054)
Log of prevailing wage X female X Haredi			-0.169***	0.147***	-0.030**	-0.006	0.283***	1.212***
			(0.020)	(0.022)	(0.010)	(0.009)	(0.061)	(0.062)
Additional variables: prevailing wage of spouse, gender, education, ethnicity/level of observance, age-gender, geographic district, intercept	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Appendix Table 2 (continued). Results of the first stage, the effect of prevailing wage and normative family size on hourly wage and the number of children in the household

Dependent variable / Explanatory variable	Panel C		Panel D					
	Log of prevailing wage X male	Log of prevailing wage X female	Log of prevailing wage X male X non-Haredi Jew or Other	Log of prevailing wage X female X non-Haredi Jew or Other	Log of prevailing wage X male X Arab	Log of prevailing wage X female X Arab	Log of prevailing wage X male X Haredi	Log of prevailing wage X female X Haredi
Additional variables: normative family size X gender	Yes	Yes	No	No	No	No	No	No
Additional variables: normative family size X sector	No	No	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.81	0.74	0.86	0.81	0.84	0.72	0.75	0.83
F	8,453.677	6,589.534	6,040.679	4,757.355	871	416.888	226.39	383.826
(p value)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Number of observations	48,451	48,451	48,451	48,451	48,451	48,451	48,451	48,451

Appendix Table 2 (continued). Results of the first stage, the effect of prevailing wage and normative family size on hourly wage and the number of children in the household

Dependent variable / Explanatory variable	Panel C		Panel D					
	Number of children X male	Number of children X female	Number of children X male X non-Haredi Jew or Other	Number of children X female X non-Haredi Jew or Other	Number of children X male X Arab	Number of children X female X Arab	Number of children X male X Haredi	Number of children X female X Haredi
Normative family size X male	1.154***	0.058***						
	(0.015)	(0.006)						
Normative family size X female	0.056***	1.148***						
	(0.006)	(0.016)						
Normative family size X male X non-Haredi Jew or Other			1.248***	0.052***	0.029***	0.000	0.011***	0.002
			(0.021)	(0.006)	(0.007)	(0.003)	(0.003)	(0.002)
Normative family size X female X non-Haredi Jew or Other			0.037***	1.266***	0.008***	0.006	0.004*	0.008*
			(0.005)	(0.022)	(0.002)	(0.006)	(0.002)	(0.003)
Normative family size X male X Arab			0.167***	0.022***	1.161***	0.020**	0.012***	0.001
			(0.013)	(0.006)	(0.045)	(0.007)	(0.004)	(0.003)
Normative family size X female X Arab			0.011**	0.204***	0.024***	1.051***	0.002	0.007*
			(0.004)	(0.016)	(0.005)	(0.039)	(0.001)	(0.003)
Normative family size X male X Haredi			0.072***	0.000	0.013***	-0.001	1.038***	0.003
			(0.006)	(0.002)	(0.004)	(0.001)	(0.019)	(0.006)
Normative family size X female X Haredi			0.002	0.093***	0.005***	0.003	0.012*	1.035***
			(0.002)	(0.007)	(0.001)	(0.003)	(0.005)	(0.017)
Additional variables: prevailing wage of spouse, gender, education, ethnicity-level of observance, age-gender, geographic district, intercept	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Appendix Table 2 (continued). Results of the first stage, the effect of prevailing wage and normative family size on hourly wage and the number of children in the household

Dependent variable / Explanatory variable	Panel C		Panel D					
	Number of children X male	Number of children X female	Number of children X male X non-Haredi Jew or Other	Number of children X female X non-Haredi Jew or Other	Number of children X male X Arab	Number of children X female X Arab	Number of children X male X Haredi	Number of children X female X Haredi
Additional variables: prevailing wage X gender	Yes	Yes	No	No	No	No	No	No
Additional variables: prevailing wage X gender X sector	No	No	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.43	0.43	0.39	0.40	0.29	0.31	0.69	0.71
F	529.186	546.525	249.674	265.656	45.084	43.460	133.648	134.484
(p value)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Number of observations	48,451	48,451	48,451	48,451	48,451	48,451	48,451	48,451

Note: Panels A and B correspond to columns (2) and (4) of Appendix Table 3, and Panels C and D correspond to columns (1) and (2) of Appendix Table 4. Panels A and B present the estimation only for employed individuals, while Panels C and D also include non-employed individuals (for whom the log of the net wage is 1). Each of the four panels includes an additional regression in which the dependent variable is the spouse's salary.

Significance levels: *p < 0.10; **p < 0.05; ***p < 0.01.

Source: Michael Debowy, Gil Epstein, and Avi Weiss, Taub Center | Data: CBS

The results of the second stage of the estimation, based on equation (2.2), are presented in Appendix Tables 3 and 4. Appendix Table 3 presents the results for work hour elasticity, while Appendix Table 4 presents the result for employment. The results and their implications are discussed at length in the body of this paper.

Appendix Table 3. Results of the second stage, work hour elasticity relative to net wage and number of children in the household

	Dependent variable: Log of work hours					
	(1)	(2)	(3)	(4)	(5)	(6)
Model of explanatory variable	OLD Single-stage	2SLS Overall	2SLS Group Influence§> 100	2SLS By population	2SLS By population (age range ± 3 for peer group)	S By population (age range ± 7 for peer group)
Log hourly wage X male	-0.1334***	0.4524***	0.3924***			
	(0.010233)	(0.071853)	(0.116281)			
Log hourly wage X female	-0.0702***	0.5563***	0.5182***			
	(0.011198)	(0.061339)	(0.131119)			
Number of children X male	0.0337***	-0.0061	-0.0143			
	(0.004388)	(0.009648)	(0.022155)			
Number of children X female	-0.0584***	-0.1287***	-0.1198***			
	0.0337***	(0.012064)	(0.027526)			
Log of hourly wage X male X non-Haredi Jew or Other				0.4345***	0.4461***	0.4595***
				(0.081844)	(0.111818)	(0.081145)
Log of hourly wage X female X non-Haredi Jew or Other				0.5281***	0.5386***	0.5503***
				(0.073744)	(0.098695)	(0.074143)
Log of hourly wage X male X Arab				0.3097***	0.3268**	0.3501***
				(0.078754)	(0.115358)	(0.084207)

Appendix Table 3 (continued). Results of the second stage, work hour elasticity relative to net wage and number of children in the household

Dependent variable: Log of work hours						
Model of explanatory variable	(1) OLD Single-stage	(2) 2SLS Overall	(3) 2SLS Group Influence§> 100	(4) 2SLS By population	(5) 2SLS By population (age range ± 3 for peer group)	(6) S By population (age range ± 7 for peer group)
Log of hourly wage X female X Arab				0.3945***	0.4090***	0.4362***
				(0.080493)	(0.111077)	(0.086528)
Log of hourly wage X male X Haredi				0.5198***	0.5424***	0.5495***
				(0.069821)	(0.112486)	(0.081345)
Log of hourly wage X female X Haredi				0.5671***	0.5884***	0.5922***
				(0.066858)	(0.100085)	(0.075936)
Number of children X male X non-Haredi Jew or Other				0.0401	0.0471	0.0183
				(0.028868)	(0.034411)	(0.028113)
Number of children X female X non-Haredi Jew or Other				-0.1076***	-0.0837***	-0.1466***
				(0.009211)	(0.009822)	(0.009150)
Number of children X male X Arab				0.0724***	0.0575	0.0899***
				(0.016865)	(0.033020)	(0.011608)
Number of children X female X Arab				-0.2501***	-0.2329***	-0.2818***
				(0.060187)	(0.053658)	(0.057486)
Number of children X male X Haredi				-0.0890***	-0.0849***	-0.0984***
				(0.012426)	(0.008286)	(0.014804)
Number of children X female X Haredi				-0.0923***	-0.0831**	-0.1087***
				(0.026634)	(0.028439)	(0.027268)

Appendix Table 3 (continued). Results of the second stage, work hour elasticity relative to net wage and number of children in the household

Model of explanatory variable	Dependent variable: Log of work hours					
	(1) OLD Single-stage	(2) 2SLS Overall	(3) 2SLS Group Influence§> 100	(4) 2SLS By population	(5) 2SLS By population (age range ± 3 for peer group)	(6) S By population (age range ± 7 for peer group)
Additional variables: wages of spouse, gender, education, ethnicity-level of observance, age-gender, geographic district, intercept	Yes	Yes	Yes	Yes	Yes	Yes
$\chi 2$ [R^2]	[0.121]	62.4	22.0	51.0	53.6	40.0
(p value)	(0.000)	(0.001)	(0.882)	(0.114)	(0.060)	(0.471)
Number of observations	48,454	48,451	28,520	48,451	48,445	48,451

Note: The peer groups are groups of individuals that were used to calculate the instrumental variables (Appendix Table 1).

Significance levels: *p < 0.10; **p < 0.05; ***p < 0.01.

Source: Michael Debowy, Gil Epstein, and Avi Weiss, Taub Center | Data: CBS

Appendix Table 4. Results of the second stage, labor elasticity relative to net wage and number of children in the household

Dependent variable: Working (yes or no)				
	(1)	(2)	(3)	(3)
Model of explanatory variable	Probit Overall	Probit By population	Probit By population (age range ± 3 for peer group)	Probit By population (age range ± 7 for peer group)
Log of hourly wage X male	0.8481***			
	(0.039616)			
Log of hourly wage X female	1.1678***			
	(0.039624)			
Number of children X male	-0.2248***			
	(0.031316)			
Number of children X female	-0.1065***			
	(0.028204)			
Log of hourly wage X male X non-Haredi Jew or Other		0.6594***	0.6525***	0.6411***
		(0.042831)	(0.044863)	(0.044140)
Log of hourly wage X female X non-Haredi Jew or Other		0.9256***	0.9143***	0.9176***
		(0.043855)	(0.044856)	(0.046555)
Log of hourly wage X male X Arab		1.3177***	1.3495***	1.3074***
		(0.061928)	(0.065289)	(0.062008)
Log of hourly wage X female X Arab		1.5844***	1.6034***	1.6106***
		(0.062135)	(0.064398)	(0.063673)
Log of hourly wage X male X Haredi		0.8799***	0.9055***	0.8840***
		(0.072283)	(0.074628)	(0.072385)
Log of hourly wage X female X Haredi		1.3103***	1.3448***	1.3218***
		(0.079304)	(0.081669)	(0.080225)
Number of children X male X non-Haredi Jew or Other		0.3438***	0.3598***	0.3305***
		(0.047529)	(0.045345)	(0.052335)
Number of children X female X non-Haredi Jew or Other		-0.2681***	-0.2215***	-0.3075***
		(0.039616)	(0.037540)	(0.043337)
Number of children X male X Arab		0.8183***	0.7678***	0.8844***
		(0.088061)	(0.083000)	(0.096611)
Number of children X female X Arab		-0.3727***	-0.3227***	-0.4597***
		(0.070840)	(0.067652)	(0.076196)
Number of children X male X Haredi		-0.2030***	-0.2295***	-0.1803***
		(0.036861)	(0.037961)	(0.037244)
Number of children X female X Haredi		0.0130	-0.0185	0.0375
		(0.035777)	(0.037451)	(0.035452)

Appendix Table 4 (continued). Results of the second stage, labor elasticity relative to net wage and number of children in the household

Dependent variable: Working (yes or no)				
	(1)	(2)	(3)	(3)
Model of explanatory variable	Probit Overall	Probit By population	Probit By population (age range ± 3 for peer group)	Probit By population (age range ± 7 for peer group)
Additional variables: wages of spouse, gender, education, ethnicity-level of observance, age-gender, geographic district, intercept	Yes	Yes	Yes	Yes
Pseudo R^2	0.120	0.139	0.138	0.138
χ^2	8,296.6	9,283.9	9,252.9	9,283.3
(p value)	(0.000)	(0.000)	(0.000)	(0.000)
Number of observations	66,127	66,127	66,121	66,127

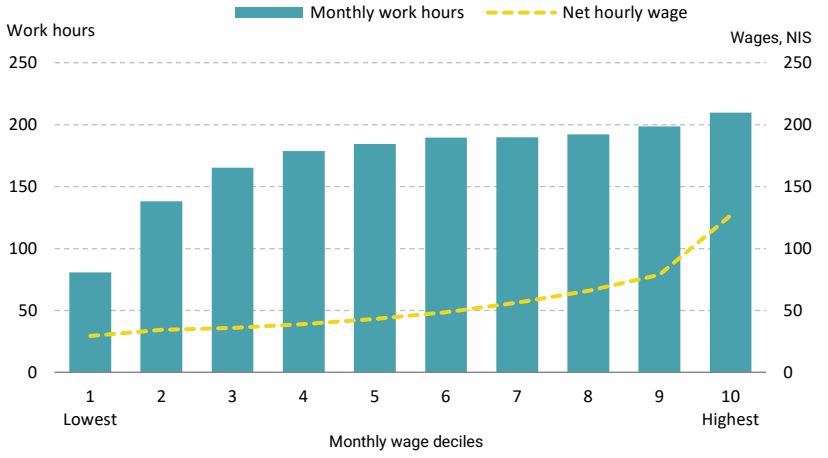
Note: The peer groups are groups of individuals that were used to calculate the instrumental variables (Appendix Table 1).

Significance levels: *p < 0.10; **p < 0.05; ***p < 0.01.

Source: Michael Debowy, Gil Epstein, and Avi Weiss, Taub Center | Data: CBS

Appendix Figure 1. Average number of monthly work hours and average hourly wage, by net monthly wage deciles

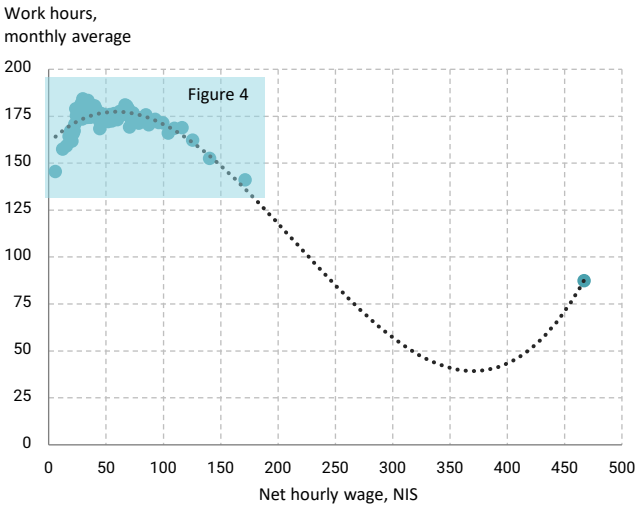
NIS, 2019 prices



Source: Michael Debowy, Gil Epstein, and Avi Weiss, Taub Center | Data: CBS

Appendix Figure 2. Correlation between work hours and wage

NIS, 2018 prices



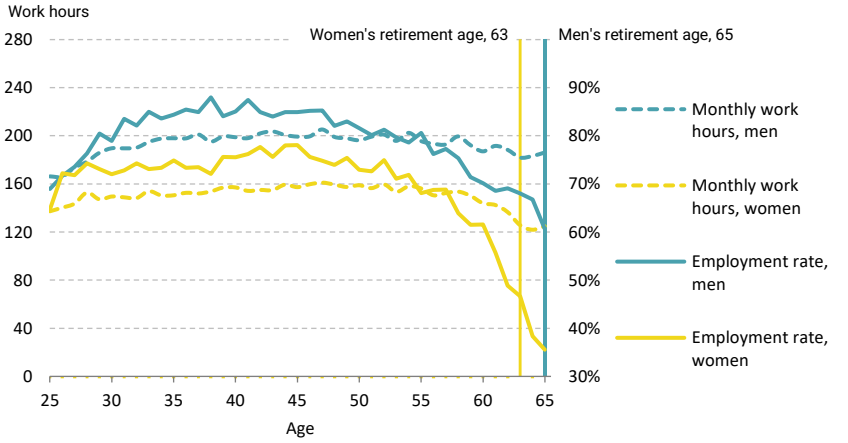
Source: Michael Debowy, Gil Epstein, and Avi Weiss, Taub Center | Data: CBS

Appendix Figure 3a. Average hourly wage, by age and gender

NIS, 2019 prices

Source: Michael Debowy, Gil Epstein, and Avi Weiss, Taub Center | Data: CBS

Appendix Figure 3b. Employment rate and average monthly hourly work hours, by age and gender



Source: Michael Debowy, Gil Epstein, and Avi Weiss, Taub Center | Data: CBS