Economic Viability of Early Childhood Investment in Israel

Analysis of the social and economic benefits of investing in children

age birth to 6 years

JDC Israel Ashalim | Social Finance Israel

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Introduction

This document is the product of a collaborative effort between JDC Israel Ashalim and Social Finance Israel, a public-benefit company that aims to promote social discourse by gaining an understanding of the economic viability of investing in the early childhood population sector in Israel, as part of a desire to change the perception of public investment in this population group.

The developing strategy of JDC-Ashalim is reflected in the analysis of the economic benefit likely to result from incremental national investment in children ages birth to 6 years in the Education and Care field. As a result, the activities of JDC-Ashalim as a developmental organization for the promotion of socioeconomic mobility should be intensified, which would in turn effect change in the situation of individuals and population groups in both the short- and mid-term, and positively impact the situation nationwide.

SFI develops social projects that are focused on measurable results in a variety of fields (including education, welfare, employment, and health) and is also responsible for executing and attaining goals and objectives within the framework of Social Impact Bonds development and result-based financial instruments. Furthermore, SFI specializes in conducting research studies that link social outcomes with their economic consequences. The link between JDC-Ashalim and SFI lays the milestones for the planning of research-based socioeconomic investment and demonstration of the benefits to the individual and to society at large.

Promoting socioeconomic mobility means enhancing the individual's opportunity for social mobility irrespective of their background attributes, including place of residence, socioeconomic class or status, and parents' educational background. In order to achieve this goal, there is a need to allocate resources, offer equal opportunities, and narrow social gaps. Inequality in developed countries, including Israel, is often a consequence of inadequate investment in both the quantity and the quality of Education and Care frameworks and services for the early childhood population group. The current level of investment in these services does not meet the common standards and recommendations in accordance with current understanding of cognitive development processes and their effect on the early years, both in the short term and in the later stages of life. Through this research study, we aim to expand and deepen the economic knowledge and discourse regarding the early years to ultimately

reflect the ROI (return on investment ratio) of improving the existing quality of frameworks to increase investment in the early childhood population of Israel.

This study examines the benefits derived from enhancing the quality of Early Childhood Education and Care (ECEC) frameworks, over three continuous years, and the long-term potential impact on the individual and on the economy in general.

In order to assess the expected benefits of an incremental investment in the early childhood population in Israel, this research study examines, for the first time in Israel, the ROI of such an investment. The findings suggest that each shekel invested in the early childhood population in Israel may be expected to produce economic benefit in the long term valued at approximately 4.8 shekels. These findings constitute a unique assessment of the Israeli case, and they can assess the prioritization of public investment in early childhood frameworks for ages birth to 3 years as a basis for promoting social mobility of low socioeconomic classes, and of society as a whole. We are pleased to present you with the products of this research study, and to promote collaborations and socioeconomic discourse for the benefit of the early childhood population of Israel.

Contents

Executive summary

This research study was carried out by Social Finance Israel, a public-benefit company, in collaboration with JDC Israel Ashalim. The objective of this research was to assess the economic benefit of incremental investment in early childhood in Israel; it is based on the existing worldwide research literature, as well as on data available in Israel. The analysis is primarily based on an estimation of the benefit that might result from enhancement of the quality of the existing Education and Care frameworks to the early childhood population, and the potential long-term effect on the individual and on the economy in general.[1] The analysis presented here is unique to early childhood in Israel and relies upon ROI studies of the early childhood group worldwide, as well as on information and data from Israel. The aspiration in the research field is to broaden and deepen the discourse and economic information on the early childhood population, and to reflect the return on investment vis-a-vis enhancement of the quality of the existing Early Childhood Education and Care (ECEC) frameworks in Israel.

Methodology

As part of developing the methodology for assessing the economic benefits of incremental investment in the ECEC frameworks in Israel, a literature review was conducted, in order to identify the existing research knowledge on this subject worldwide.[2] A majority of the studies that were surveyed are based on longitudinal studies that tracked groups of children from age birth to 6 years that had been enrolled in early childhood ECEC frameworks, and then on through the years of adolescence and beyond - and measured their performance in the areas of education, employment, welfare and health over time, starting at kindergarten age and

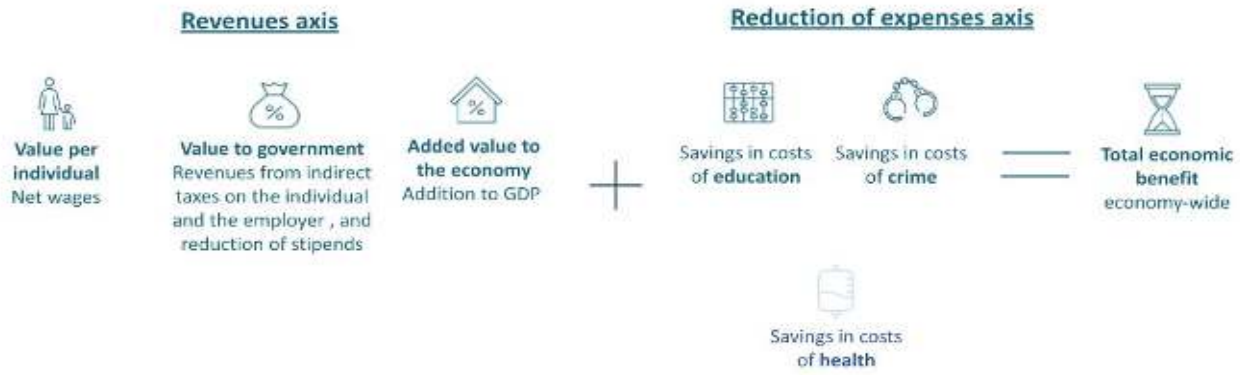
[1] It should be noted that this research study does not engage in definition of the quality of the frameworks, or the composition of the investment required for its improvement, but rather focuses on the economic benefit of incremental investment for the qualitative enhancement and improvement of the frameworks that is rendered.

[2] This paper examines the economic benefit that is expected to result from qualitative enhancement and improvement of Early Childhood Education and Care frameworks in Israel and does not take into account the potential benefit of quantitative expansion of these frameworks, including the establishment and subsidization of additional frameworks for children of this age group. In addition, it should be noted that there may be additional investment alternatives and platforms for early childhood that are unrelated to the ECEC frameworks (such as Well-Baby Clinics, child developmental units and the like) that have the potential for economic benefit, which were not assessed in the framework of this research study.

extending into their thirties. This analysis relies on estimations presented in these research studies, which link early childhood investment to long-range economic benefit.

Analysis of the economic viability of early childhood investment in Israel:

Components of the research study



Savings costs on crime

Analysis of the benefit of incremental investment in the early childhood population group along the **revenues axis** was based on consideration of the potential effect on a single age cohort comprising an average age group of the population in Israel, which is estimated at approximately 181,000, throughout their lifetime - beginning at the early years and ending at the end of their participation in the labor market, given a stable and continuous investment scenario of three years, during the years between birth and 6 years. One age cohort was subdivided into sectors based on deciles, Ultra-Orthodox sector and Arab sector, in order to create proper representation of the population in Israel and its unique attributes.[3] On the revenues axis, for the sake of taking a conservative approach, deciles 6 through 10 were excluded, based on the assumption that no incremental contribution was expected among the children of the higher deciles, and that in this scenario, government funding would absolutely replace existing parental funding.[4] For the **reduction of expenditures axis**, the expected

[3] Based on the percentage of the sectors within the population, ages birth to 6 years in 2019, the latest year of data released by the Central Bureau of Statistics.

[4] The objective of excluding deciles 6-10 from the estimation of benefit likely to result, was to assume as conservative an estimate as possible in regard to the resulting predicted economic value, and the multiplier effect that derives from it. It is entirely possible that given the current Israeli reality, the economic benefit from incremental investment may be expected to trickle into additional deciles in this group (deciles 6-7).

benefits for the entire age cohort were averaged in.[5] Then, the labor force data, employment and wages were mapped and averaged in, according to sector and gender, and the effect was examined over the course of 30 years, representing the duration of the individual's participation in the labor market. Following the distribution of the economic benefit over the years, all sums were eventually discounted at a 5% rate, to reflect the expected economic benefit in today's terms (Net Present Value).[6]

Method of analysis and working premises

Analysis of economic benefits throughout the employment years, for the incremental investment in a single age cohort of the population

Subdivision into sectors – among children from birth to 6 years

[5] This research study analyzes the aggregate value that was produced over the lifetime of an age cohort in the population and does not relate to the date or age at which said value was produced.

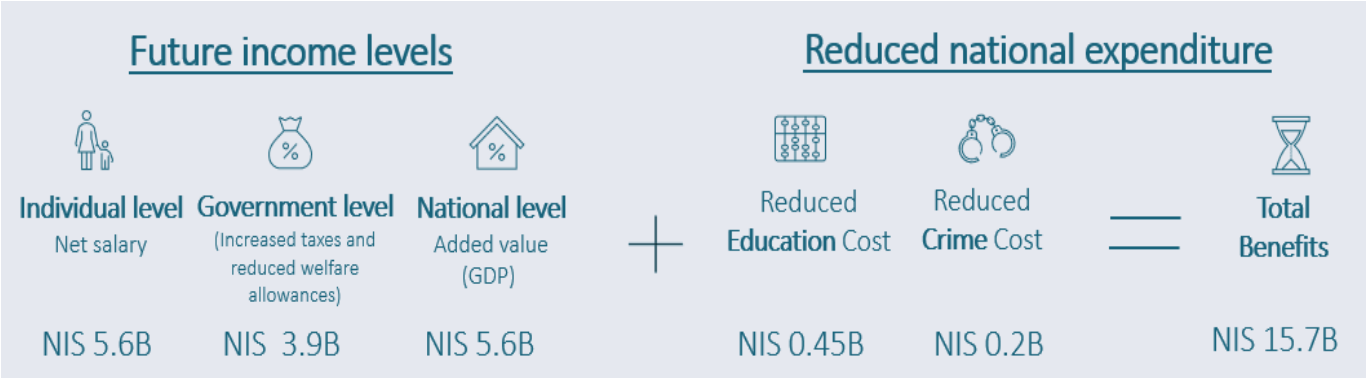
[6] The discount rate that was chosen (5%) represents a conservative assumption regarding the weighted discounted value for all the sources (economy, government and individual) that will economically benefit from investment in the early childhood population group. It may be assumed that for the government, the discount rate is necessarily lower, such that the economic benefit is higher than that which is presented in this study. For the sake of being conservative, a uniform discount rate was presented, and an analysis of the sensitivity of the findings to this discount rate is examined in the chapter "Sensitivity Scenarios," which appears below.

Main findings

The sum total of economic benefit of the investment in early childhood, in a specific age cohort of the population, is estimated at approximately 15.7 billion New Israeli Shekels (or NIS, henceforth referred to as shekels), which reflects the total economic value created over the years of a certain age group within the population and is equivalent in value to about 1% of the annual Gross Domestic Product in Israel.[7]

Out of the total benefit, approximately 15.1 billion shekels is associated with the revenues axis and includes up to 5.6 billion shekels value created per individual (net wages), about 3.9 billion shekels value created for the government as a result of increased tax revenues and reduction of government allowances, and an additional 5.6 billion shekels, reflecting the added value generated to the economy as a result of growth of the GDP. Additionally, along the expenditure's axis, the savings on costs of special education in the early childhood incremental investment scenario is estimated at about 0.45 billion shekels, with the saving on costs of crime estimated to be about 0.2 billion shekels.[8]

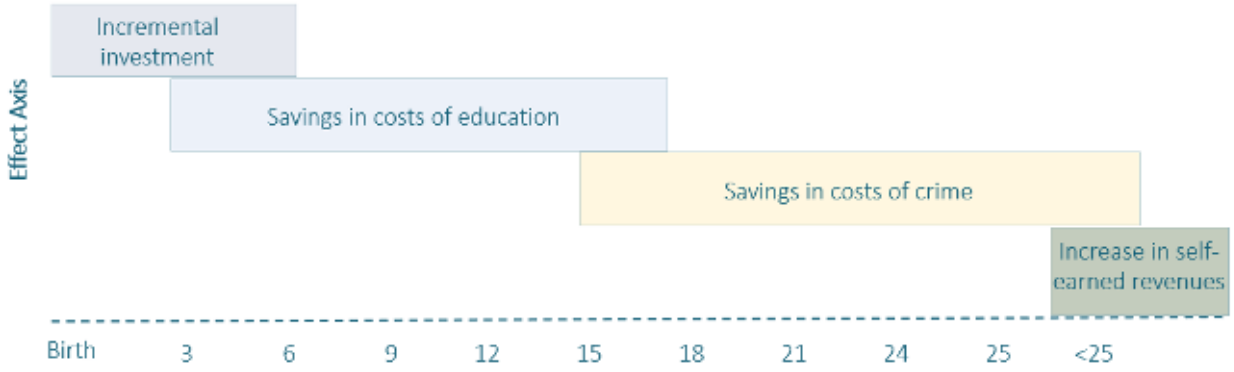
Sum total of the economic benefit of early childhood investment



[7] Compared with the GDP in 2019, according to Central Bureau of Statistics data

[8] The savings on costs of education cited in this study reflect the national savings realized by the education system in an incremental early childhood investment scenario, and do not give a weighted average for the indirect potential savings of parents for supportive para-medical expenditures.

Economic benefit in relation to the ages of the age cohorts being analyzed (over a lifetime)



Estimation of the requisite incremental investment

At present, there is no consensus on the budgetary scope required to make a more effective investment that would improve the quality of Early Childhood Education and Care (ECEC) frameworks in Israel. Therefore, the estimation of the incremental investment cost of a qualitative expansion of the early childhood frameworks in Israel was based on the most up-to-date official estimation that was published by a relevant public authority. To that end, we adhered to the estimated implementation cost of the oversight regulations on daycare centers for toddlers, as presented by the Ministry of Labor, Social Welfare and Social Services to the Knesset's Special Committee for the Rights of the Child in December 2020. This incremental cost, which was estimated at a one-time cost of approximately 75 million shekels and an annual cost of approximately 600 million shekels for the licensed (*Semel* in Hebrew) and private preschools, incorporates regulations related to structural aspects (area, regulatory ratio, group size); training, in-service training for directors, caregivers and counselors; developmental-educational conduct in the daycare center; safety and reduction of risks and dangers, and expansion of communication and reporting to parents.[9] For the purpose of calculating the investment scenario in the age cohort examined in this study, it was assumed that this

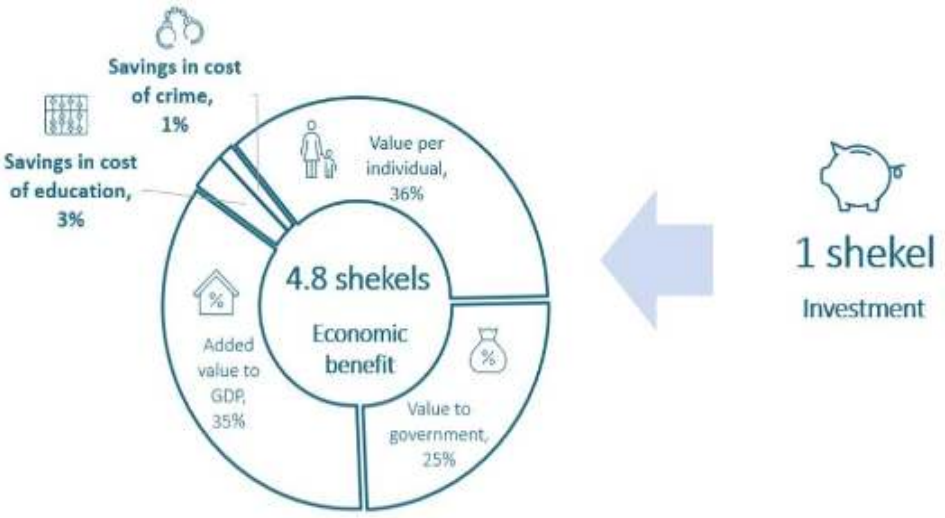
[9] Supervisory regulations for daycare centers for toddlers, the Ministry of Labor and Social Welfare and Social Services, presented at the Special Committee for the Rights of the Child, December 2020.

incremental investment would be required for three years, for a single age cohort between the ages of birth and 6 years, at an estimated total of approximately 3.3 billion shekels.[10]

The multiplier effect of early childhood investment

The economic benefit of investment at ages birth to 6, amounting to approximately 15.7 billion shekels, divided by the requisite investment cost, amounting to approximately 3.3 billion shekels, reflects an ROI (multiplier effect) of approximately 4.8 shekels - for each 1 shekel of investment in early childhood - generating long-term economic benefit valued at approximately 4.8 shekels, of which 4.6 shekels results from the increase in income. The value that is generated is subdivided by individual (36%), government (25%) and the rest of the economy (35%). The savings realized on government expenditure on education and on crime due to prior investment amounts to approximately 4% of the generated value.

The economic benefit of investment in early childhood in Israel



[10] For additional detail on the process through which the estimation was calculated and executed, see the sub-chapter "Estimation of the requisite incremental investment."

In international comparison, the multiplier effect in Israel that is associated with revenues (4.6) is similar to research studies elsewhere in the world, which affirms the credibility of the findings. On the other hand, Israel's overall multiplier, which is also based upon the savings on the expenditure's axis, is lower than that found elsewhere in the world. This gap is possibly a byproduct of the variance of the components that were included in the framework of the savings on expenditures axis, the variance that may exist between observations and estimates, the attributes of the population groups included in the studies (general population as opposed to at-risk population groups) and the relatively low crime rates in Israel as compared with the U.S.

Comparison of multipliers in relation to findings worldwide

Year of Publication	Total Multiplier	
2011	10.8	CPC, Chicago
2015	8.6	Office of the President of the United States
2016	7.3	National Bureau of Economic Research, U.S.
2021	**4.8**	**SFI – JDC – Ashalim**

Year of Publication	Revenue Multiplier	
2013	5.9	Oklahoma and Georgia, U.S.
2021	**4.6**	**SFI – JDC – Ashalim**
2015	4.4	Office of the President of the United States
2012	3.7	Tulsa program – Half days
2011	3.4	CPC – Chicago
2012	3.1	Tulsa program – Full days
2010	1.6	Head start program

Conclusion

This research study aspires to broaden the discourse and the economic information regarding the benefit of investing in early childhood in Israel. Its findings reflect the inherent viability of incremental investment in early ages, in socioeconomic terms, both for the individual and for the society and economy in general. This study is unique in the early childhood field in Israel, and its objective is to provide additional tools for future planning and for maximizing the

economic and social value of this investment. We should not disregard the fact that a budgetary challenge exists when it comes to an investment that generates long-term economic benefit. Nevertheless, considering these findings and the global literature on the subject, the educational and vocational challenges faced by Israeli society, and the accelerated and continuous rate of population growth, long-range and long-term planning and investment is required, to promote the skills, abilities and level of productivity of the individual in society, and to reinforce the social infrastructure and potential for social mobility in Israel.


Literature Review – Global Research
The formulation of the methodology for examination in Israel
An analysis of the economic benefits that arise from the lifetime of this age group in Israel's population (181,000 people)
that have experienced an additional investment in children during early childhood on two axis:
2
Cost-saving axis
Saving in education costs
Saving in costs associated with crime
1
Revenue growth axis
Increase in individual income due to an increase in higher level education
Derive the relevant estimates from the research literature
And adapting to the characteristics and costs for Israel
Distributable to sectors per the characteristics of the population in Israel
(Lower social-economic, Orthodox, Arab)
And weighting labor data, employment, and wages according to sectors
The economic benefit from saving on education and crime costs
Throughout the lifetime of the age-tested group
The economic benefit from an increase in individual income
The benefits created include reduced allowances, increased State income taxes, and the value-added to the national economy
=
It's estimated that the total economic benefit produced will be in billions ₪
In a stable incremental investment scenario at the tender age
The estimated additional investment required
Investment in a single age group in Israel's population for three consecutive years, in the ages of 0 to 6
Derive the impact multiplier of early childhood investment
And comparing it to the multipliers of influence in the literature review
Estimate that the total economic benefit generated compared to the cost of an incremental investment required

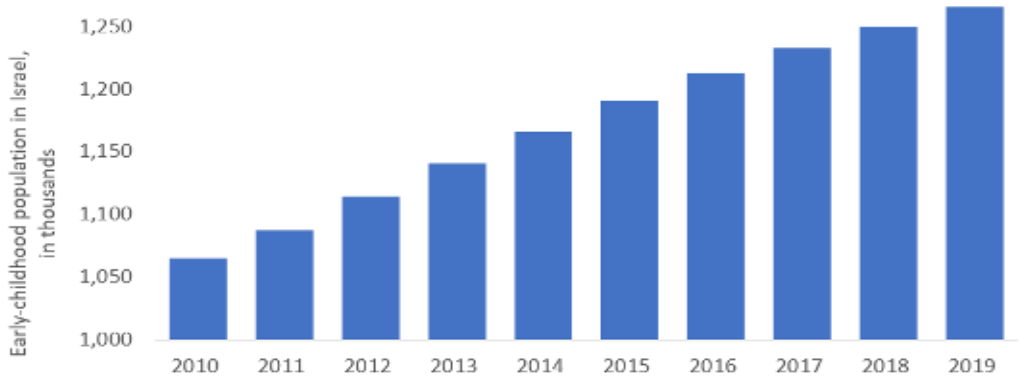
Early childhood attributes: Unique aspects of the Israeli case

Due to its demographic and cultural attributes, Israel is in great need of high-quality task-focused education and care frameworks for the early childhood age group. Part of what makes the Israeli case unique is high birth rates that lead to a heightened rate of growth of the early childhood population, along with a high percentage of working mothers accompanied by high percentage of integration in childcare frameworks.[11]

Attributes of the Israeli case

Israel has one of the world's highest birth rates, which leads to an accelerated growth rate of the early childhood age group in the population. As of 2019, the early childhood population in Israel stands at approximately 1.3 million, a figure that represents an approximately 19% increase over the past decade for the population of children ages birth to 6 years.

Early childhood population in Israel, year by year

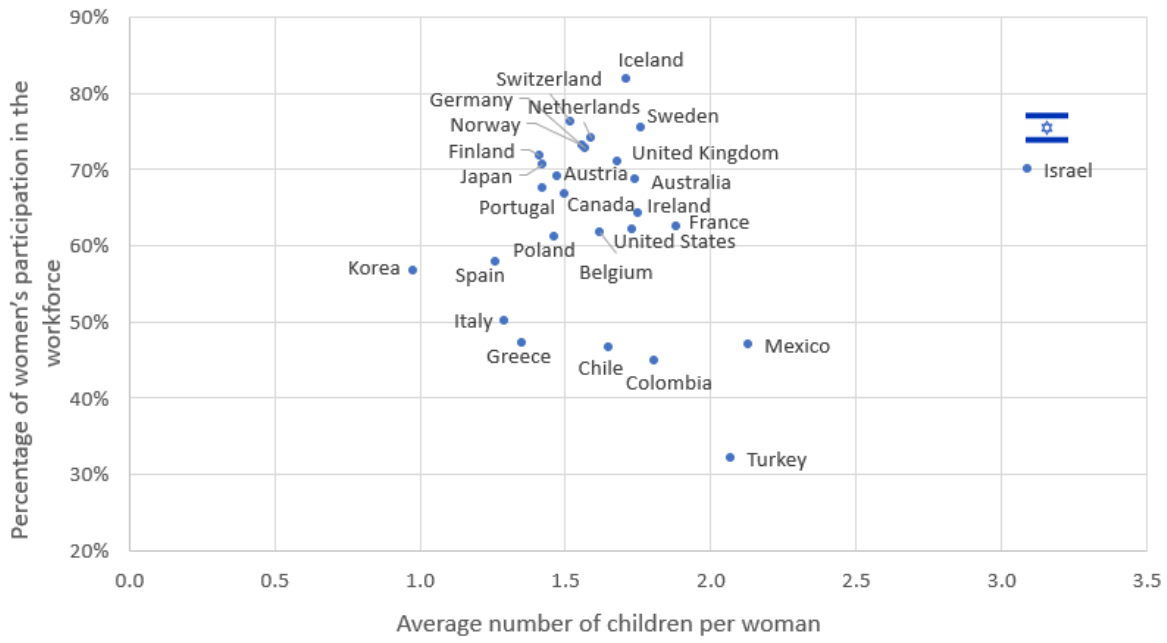


Source: SFI adaptation of Central Bureau of Statistics data

[11] Early Childhood - Accomplishments and Challenges in the Development of Services in the State of Israel, Noa Ben-David, JDC Israel Ashalim, 2018

In international comparison, Israel leads with high birth rates that are estimated at approximately 3.1 children per woman in the general population, along with a high rate of female participation in the labor market, up to approximately 70 percent. This data does not reflect gaps in birth rates among various population sectors in Israel, as exists in the Ultra-Orthodox sector, where the gap in comparison with the rest of the world is growing wider.[12] The significant gap in birth rate and female participation in the labor market bolsters the unique need for high-quality education and care frameworks. Moreover, the average rate of working mothers in Israel is not affected by the age of the child, which is expressed in the high rate of participation of children of early childhood age in preschool frameworks as compared with other OECD member states.[13]

Birth rate and rate of participation by women in the workforce in Israel, in comparison with the situation internationally



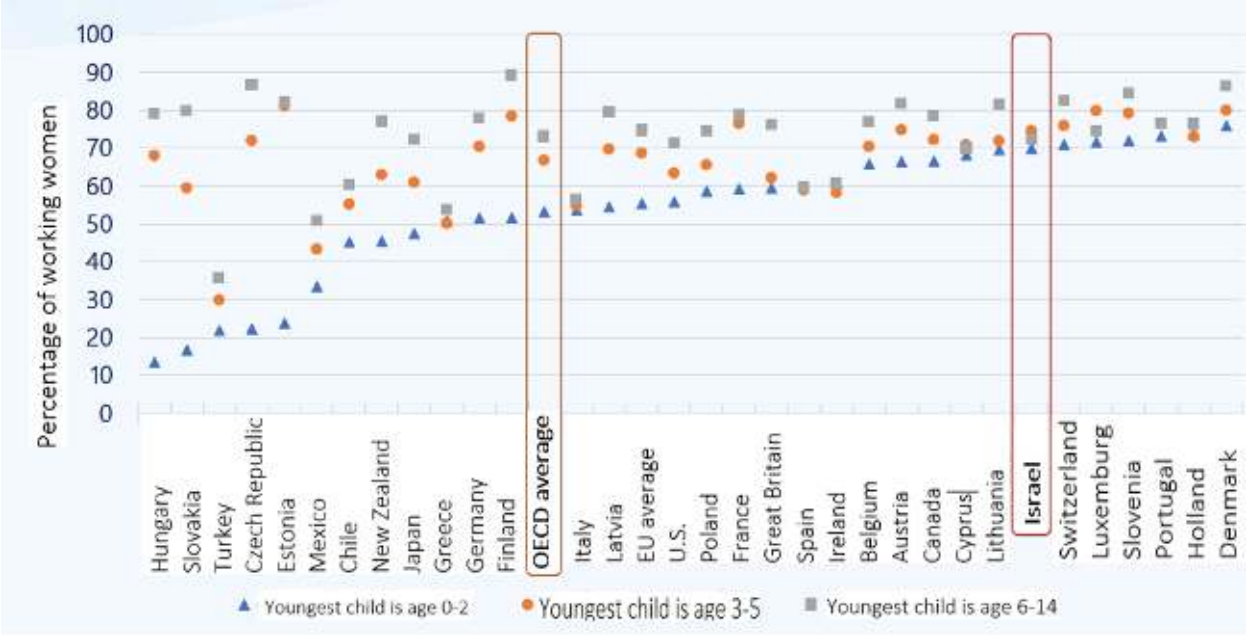
Source: SFI adaptation of World Bank data (2018) and OECD data (2019-20); Data on Israel is based on Central Bureau of Statistics data; mode of representation based on representation in the article by Professor Manuel

[12] Fertility rates specific to age as well as overall fertility rate: Ultra-Orthodox-Jewish women, Central Bureau of Statistics, 2019

[13] Quality of education-care in frameworks for children below age 3, from the TALIS OECD Teaching and Learning International Survey, for early childhood frameworks, 2017 data, Noa Ben-David and Yoav Gutman, JDC-Ashalim and the Ministry of Labor, Social Welfare and Social Services, 2020

Trajtenberg "Turning the Pyramid Upside Down - Vision and Policy for Early Childhood in Israel," Samuel Neaman Institute, 2019

Percentage of working mothers ages 15-64, international comparison



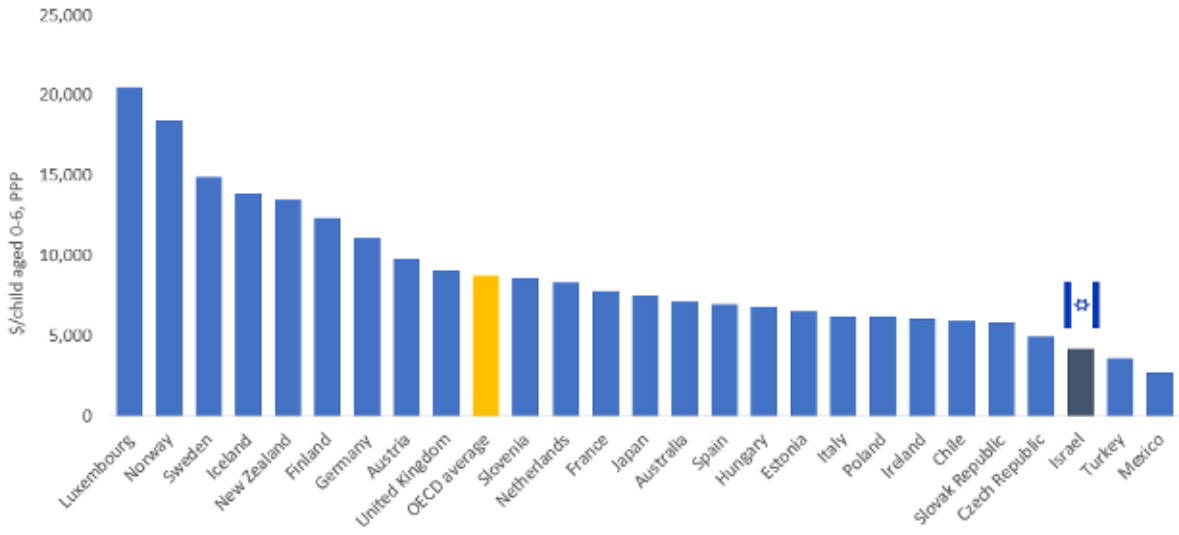
*Based on age of youngest child, from 2014 onward; Source: Education and care quality in frameworks for children under age 3, in the OECD International TALIS study of early childhood frameworks, 2017 data, JDC-Ashalim and the Ministry of Labor, Social Welfare and Social Services

Despite the higher need in Israel for high-quality frameworks specifically for these ages, in international comparison, the annual investment in early childhood in Israel is significantly low in comparison with other OECD countries and is estimated at approximately $4,300 per child - about one-half of the average in the developed countries.[14]

[14] In purchasing power terms, OECD, 2015 data

Annual investment in early childhood education, international comparison

Ages birth to 6 years, in terms of purchasing power (PPP)



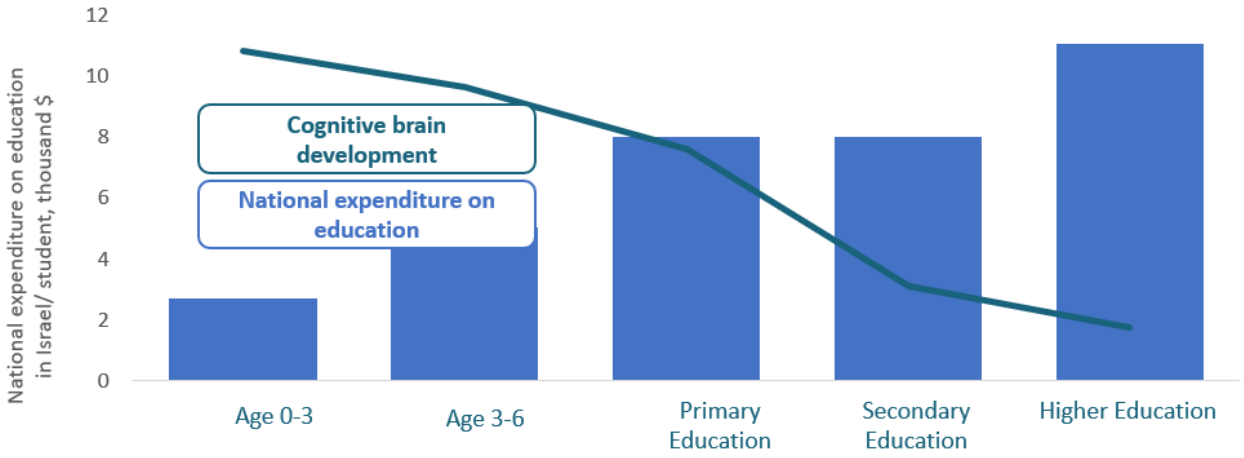
Source: OECD 2018 based on 2015 data; financing by public and private institutions

The reduced investment in ages birth to 6 years in Israel is in reverse correlation to the critical period of brain development; neuroscience studies reveal that the critical ages for cognitive development are within this age range (birth to 6 years), during which the cognitive, social and emotional capabilities come into being and develop.[15] When comparing the annual investment per child in Israel and worldwide, and in consideration of the development rate of cognitive skills as reflected in neuroscience studies, there is a significant need for increase and reallocation of educational resources to the critical ages in order to optimize the human potential and the attendant long-term economic benefits.

[15] From "Turning the Pyramid Upside Down - Vision and Policy for Early Childhood in Israel," The National Research Council and Institute of Medicine, Samuel Neaman Institute, 2019

Investment in education in Israel in comparison with the rate of cognitive development

Annual national expenditure on education per individual, in comparison with the critical ages for cognitive development, by educational ranking



*In thousands of dollars, in terms of PPP; Source: SFI adaptation of Central Bureau of Statistics data for 2015; data on investment in early childhood 0-3 and 3-6 is based on National Research Council and Institute of Medicine, OECD 2000, 2017

Investment in early childhood as a means of advancing social mobility

The quality of education and care frameworks in early childhood in Israel has significant potential to affect the social mobility of various population groups.[16] The absence of adequate public programs in Israel for the birth to 3 years age group means that the quality of the services currently offered to children is directly derived from their socioeconomic status, sectoral affiliation, geographical location, and their families' economic capability. That being the case, and in light of the importance of this period to optimal development, long-term significant gaps can form between various groups in Israeli society during this period.[17] Therefore, the extent of investment in and funding of high-quality programs for early childhood

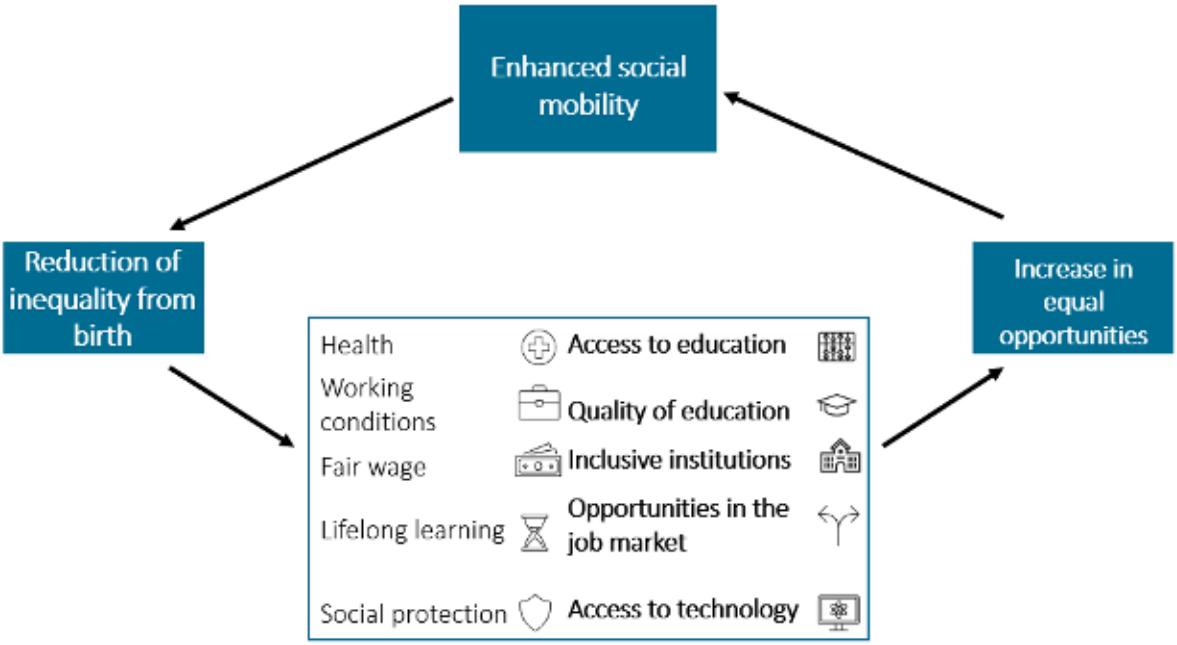
[16] The information map for social mobility of children and youth, JDC Israel Ashalim, Ministry of Education, ERI Institute, 2019

[17] An optimal array of services for early childhood children and their parents in the local authority, JDC Israel Ashalim, Ministry of Labor, Social Welfare and Social Services; Myers-JDC-Brookdale Institute, 360° National Program for At-Risk Children and Youth, Rashi Foundation, 2019

has significant potential to affect the reduction, preservation, or expansion of inequality in Israeli society, as well the social mobility potential of various population groups.

Reinforcement of this link is found in the social mobility model of the World Economic Forum, which demonstrates the relationship between the factors that may promote or impede social mobility. Among the leading factors are access to high-quality inclusive education, opportunity in the labor market, fair wages and working conditions. We expect that high-quality education will lead to an increase in equal opportunities, which may in turn enable increased social mobility.

Factors that promote social mobility, according to the World Economic Forum



Source: World Economic Forum (2020)

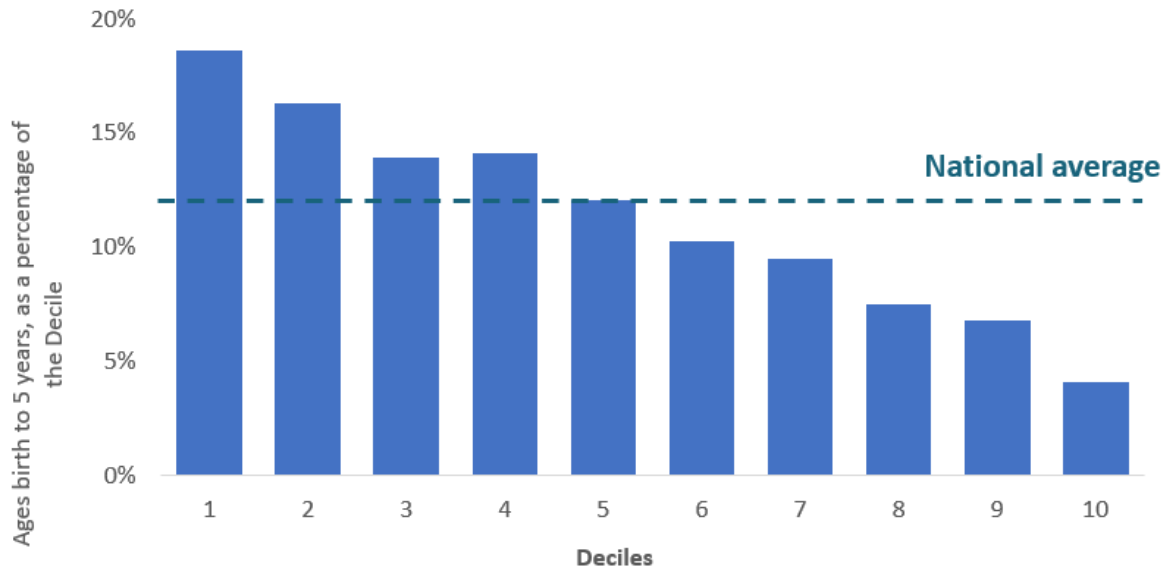
At the present time, a differential approach is being implemented in daycare centers for early childhood (ages birth to 3 years), by means of subsidization of the cost based on a review of the parents' income, number of children in the family and additional supporting criteria.[18] This approach has a limited effect, partly because of the limited scope of the supervised preschool frameworks, to which this approach applies, and which constitute a response to only about 25

[18] Criteria (support tests) for state participation in tuition cost in frameworks for children, from the website of the Ministry of Labor, Social Welfare and Social Services

percent of the early childhood children ages birth to 3 years.[19] At kindergarten age, as well, due to gaps between the local authorities that stem from commercial property-tax payments and tuition paid by parents, the need for a differential budget should be considered, in order to reduce gaps and promote social mobility.[20]

Additionally, the cost that parents potentially save is not necessarily translated into better education or care frameworks for children;[21] as the percentage of children age birth to 5 years is significantly higher among households in the lower five deciles in Israel - double that of the upper five deciles, and 3.7 times higher than the highest decile. This means that most children in the early childhood years are found in economically weak population groups.

Children in early childhood years, by decile



Percentage of children age birth to 5 years in Israel, as part of the decile

Source: SFI adaptation of Central Bureau of Statistics data (2018)

[19] Beginning in 2019, in accordance with the Daycare Supervision Law, all early childhood frameworks are required to be in possession of initial certification. This document relates to supervised frameworks operated by the Ministry of Labor, Social Welfare and Social Services

[20] "Springboard to Social Mobility" - the Rashi Foundation's initiative for social mobility; National policy recommendations, Rashi Foundation, 2019

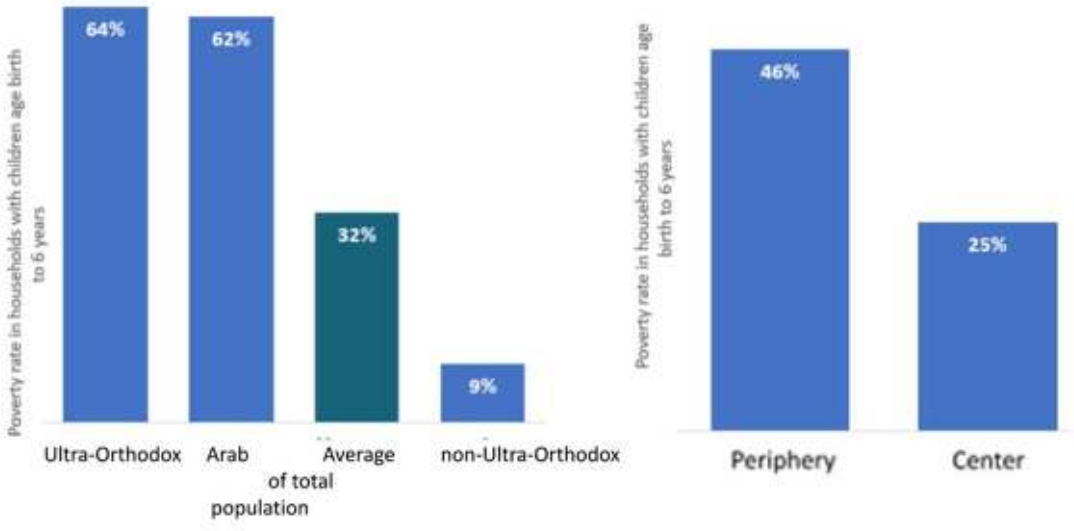
[21] Frameworks for early-childhood children and the governmental supervision of them, Knesset Research and Information Center, 2020

In a cross-sectoral analysis of economic status of households with children age birth to 6 years, it was found that in 62% of the households in the Arab sector and 64% of Ultra-Orthodox households with children age birth to 6 years are in a state of poverty, as opposed to an average of 32% in the general population, and only 9% among non-Ultra-Orthodox Jews. This means that in the absence of adequate government investment in early childhood in Israel, increased harm to the weakened population groups in Israel occurs, mainly amongst groups that are largely unable to privately finance a high-quality educational response.

Therefore, we should consider three different investment perspectives, in accordance with three different socioeconomic perspectives: the first considers universal investment to be a primary value, and assumes that the bolstering of universal services, including early childhood education systems, will improve the situation of the children coming from a low socioeconomic background. The second sees differential investment as a solution for decreasing inequality among children from weakened backgrounds. The third approach, known as 'progressive universalism' stresses the idea that the standards and qualities of the early childhood frameworks should be applied to the entire population, and special education programs should be made available to those who are in need.

Early childhood population in Israel, by sector and geographic region

Poverty rate in households with children age birth to 6 years



Source: Central Bureau of Statistics, 2018

Research methodology

As part of developing the methodology for analysis of the economic benefit of incremental investment in early childhood in Israel, a survey of the literature and the existing information on this subject worldwide was carried out. Most of the studies that were surveyed are based on long-term research, in which groups of children who were in specific early childhood frameworks all through their maturation, and measured their achievements in education, employment, welfare and health over time, starting with the kindergarten years and up to age 30. This research is based on the estimations presented in these studies, which link between investment in early childhood and the long-range economic benefit and are adapted to the available data existing in Israel.

Based on the studies that were surveyed, it is evident that the main economic return on investment in early childhood results from the improvement of scholastic achievements in the short and long terms, which were calculated on the basis of crosswise testing in accordance with the ages that were examined, which are accompanied by higher wages through the years of participation in the labor market and the reduction of welfare government allowances (the "revenues axis"). In some of the studies, in which observations were carried out over a course of several years, researchers tracked the progress of children who had been in specific frameworks, until reaching ages 26-30, and evaluated the economic benefit of additional social compensations among them, due to crime reduction and savings on costs of education and health ("reduction of expenditures axis"). The multiplier effects in these studies varied from 1.6 to 5.9 on the revenue's axis, and from 7.3 to 10.8 for the overall multiplier, which weighs the attendant benefits on the reduction of expenditures axis.[22]

[22] For further details, see Rand Corporation, 2016

Studies analyzing the economic benefit of early childhood investment

	Head Start program	Tulsa program – half days	Tulsa program – full days	Oklahoma and Georgia research studies, U.S.	CPC Chicago	National Bureau of Economic Research, U.S.	Office of the President of the United States
Year of publication	2010	2012	2012	2013	2011	2016	2015
Research method	Estimates future wage based on academic achievement in schools	Estimates future wage based on achievements in kindergarten	Estimates future wage based on achievements in kindergarten	Estimates future wage based on school achievements	Observations and follow-up on achievements of participants of the program, up to the age of 26	Observations and follow-up on achievements of the participant of the program, up to age 30, and estimates of future achievements	Survey of research studies and existing assessments, based on observations
Income multiplier	**1.58**	**3.66**	**3.06**	**5.9**	**3.39**	****~2.4**	***4.4**
Overall multiplier	-	-	-	-	**10.83**	**7.3**	***8.6**
Social compensation that was included	Increase in self-earned income				Increase in income, reduction of crime, surplus costs in the fields of social welfare, education, and health	Increase in self-earned income and reduction of stipends, increase in parents' income, reduction of crime, health benefits (QALYs)	Increase in self-earned income and reduction of crime, savings of costs in the educational system
Investigators	Duncan et al.	Bartik et al.	Bartik et al.	Cascio et al.	Reynolds et al.	Heckman et al.	Based on Heckman et al. (2010)

* The multiplier effects are based on the study conducted by Heckman (from 2010)

** Based on sensitivity tests presented in the study

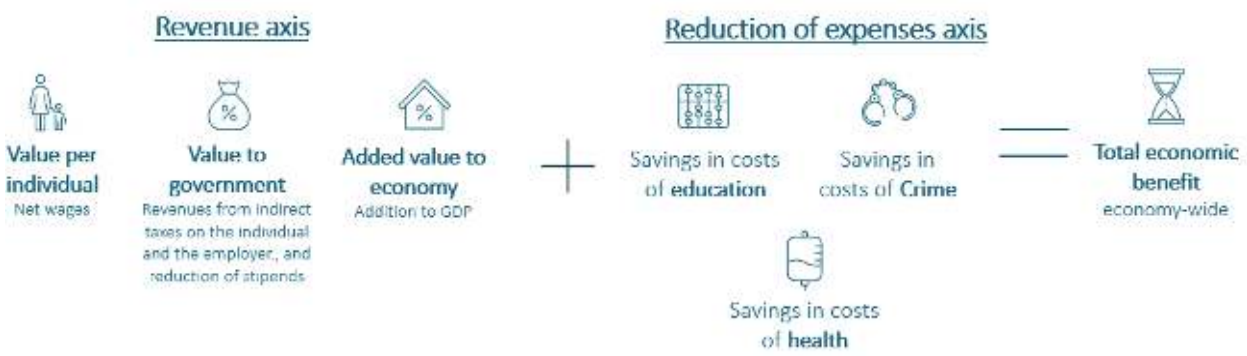
As part of aligning the methodology with the Israeli case, we found a potential variance in scope and intensity of the effect of early childhood investment in Israel, as opposed to the population groups examined in the framework of studies conducted throughout the world and specifically in the U.S., which are for the most part described as at-risk populations. Using these estimates, even though they have been applied to local attributes, we assume that the global findings constitute a reliable indicator of the potential effect in Israel.

Methodology for economic viability's study of early childhood investment in Israel

In accordance with methodologies presented elsewhere in the world, the main components surveyed in the framework of the analysis of economic viability of early childhood investment in Israel are based on two primary axes: the revenues axis, which is based on estimates of improved short-range and long-range scholastic performance in the investment scenario, and its effects on wages and employment over time, and the savings on expenditures scenario, which reflects the savings on education system costs, costs of crime and health costs, attendant

to the early childhood investment, based on estimates found in the literature and their adaptation to the Israeli context.

Analysis of the economic viability of early childhood investment in Israel: primary components that were surveyed



Revenues axis

Analysis of the benefit of incremental early childhood investment along the revenues axis was based on analysis of the potential effect on an average age cohort in the Israeli population, estimated at approximately 181,00 people, throughout its lifetime - beginning with its toddler years and ending when it ceases to participate in the workforce, in a stable and continuous investment scenario during the age range of birth to 6 years. The age cohort is subdivided into sectors on the basis of deciles (non-Ultra-Orthodox Jewish sector), Ultra-Orthodox sector and Arab sector in order to create appropriate representation of the population in Israel and its unique attributes.[23] For the revenues axis, for the sake of a conservative approach, deciles 6-10 in the non-Ultra-Orthodox Jewish sector were excluded from calculation, under the assumption that no incremental contribution could be expected among children of the upper deciles and that in this scenario government funding would undoubtedly replace existing parental funding.[24] For the savings on expenditures axis, the anticipated benefits for the entire age

[23] Based on the share of each sector in the birth to 6 years age group in 2019, the most up-to-date data released by the Central Bureau of Statistics.

[24] The exclusion of deciles 6-10 from the estimation of expected benefits is meant to take as conservative an approach as possible regarding the economic value likely to result, as well as the multiplier effect that is derived from it. It may certainly be that in the current Israeli reality, the economic benefit from incremental investment can be expected to trickle down to additional deciles in this group (deciles 6-7).

cohort were weight-averaged to take these factors into account.[25] Afterwards, data for workforce, employment and wages was mapped out and calculated on the basis of sector and gender, and the effect over a period of 30 years was analyzed, representing the duration of the individual's participation in the labor market. Following a distribution of the economic benefit over the course of these years, these benefits were discounted at a 5 percent rate in order to reflect the anticipated economic benefit in today's terms (Net Present Value).[26]

Revenues axis: Method of analysis and working assumptions

Analysis of economic benefits throughout the employment years, from the incremental investment in a single age cohort of the population

In analysis of the research literature on the early childhood effect on education, estimates were found that varied from an 8% to a 20% increase in acquisition of postsecondary education among alumni of specific education-care early childhood programs, as compared with the control group.[27] Our study is based on the estimate presented by Heckman and Garcia (2016),

[25] This research study analyzes the aggregate value that was produced over the lifetime of an age cohort in the population and does not relate to the date or age at which said value was produced.

[26] The discount rate that was chosen (5%) represents a conservative assumption regarding the weighted discounted value for all the sources (economy, government and individual) that will derive economic benefit from investment in the early childhood population group. It may be assumed that for the government, the required discount rate is lower, such that the economic benefit is higher than that which is presented in this study. For the sake of being conservative, a uniform discount rate was presented, and an analysis of the sensitivity of the findings to this discount rate is examined in the chapter "Sensitivity Scenarios"

[27] Reynolds et al., 2011; Heckman and Garcia et al., 2016; Barnett and Masse, 2007

which presented a uniform effect that is not gender-conditional and was deemed to be sufficiently conservative, and which maintains a growth of approximately 13 percent in the acquisition of postsecondary education among alumni of the frameworks that were investigated, an estimate that is situated in the middle of the range cited in the literature.

The effect of the increased acquisition of education led to standardization of the future wages of these individuals. The estimates related to an increase in wages are based on the gap between secondary education and postsecondary education.[28] For the effect on rate of employment, the Central Bureau of Statistics data was calculated for workforce and rate of employment based on sector and gender.[29] Savings on government allowances was based on Central Bureau of Statistics data for income from government allowances and support, based on deciles.[30] An estimate of the addition to the GDP as a result of the increase in wages is based on a wage-to-GDP ratio as published by the Bank of Israel, in which it was demonstrated that for every shekel of wages in the economy, an added value of 0.66 shekel was produced.[31] The anticipated rate of increase in tax revenues is an estimate based on the ratio between state revenues from taxes as published by the Ministry of Finance for 2019, and the GDP for that year according to the Central Bureau of Statistics, and it reflects the value created for the government by means of an increase in tax revenues, out of the sum total addition to the anticipated GDP.[32]

It should be noted that in terms of the increase in employment as a result of acquiring postsecondary education, the potential effect on women from the Arab sector and men from the Ultra-Orthodox sector was excluded. This was done for the sake of a conservative estimate, and under the assumption that incremental early childhood investment would not alter social norms that are reflected in the rates of employment in these sectors.

[28] Gross monthly income from a salaried position, according to number of years of study and gender, 2018
[29] Age 15 and above, according to attributes of labor force, population group, years of study and gender, Central Bureau of Statistics 2018; Arabs age 15 and above, according to attributes of workforce, age, years of study, highest educational certification received, and gender, Central Bureau of Statistics 2018; Education and Employment in the Ultra-Orthodox Sector, Taub Institute, 2013
[30] Monthly income and expenses on consumption in deciles of households, based on gross monetary income per household, Central Bureau of Statistics, 2018
[31] Aggregate Activity: GDP and Employment, Bank of Israel, 2015
[32] Gross Domestic Product and Uses of Resources in the Years 1995-2019, Central Bureau of Statistics, 2020

Economic benefit as a result of increase in revenues

For the age cohort being analyzed, with the exclusion of deciles 6-10

* Based on a study of the National Bureau of Economic Research in the U.S., led by Heckman and Garcia, 2016

** Adaptation of Central Bureau of Statistics data

*** Deducting Ultra-Orthodox sector men and Arab sector women

Sources: GDP-Wage Ratio according to Bank of Israel, 2016; Tax revenues according to Ministry of Finance, 2020; Total GDP according to Central Bureau of Statistics

Savings on expenditures axis

Analysis and working assumptions of the savings on expenditures axis cited below are appropriate to that which is cited for the revenue's axis, other than the sectoral-gender references that are primarily relevant to the labor market and attributes of employment in Israel. The economic benefits on the savings on expenditures axis reflect the sum total of derived savings to the economy for 100% of the volume of a single age in the population, including deciles 6-10, over the course of 30 years, and a discount rate of 5%, in order to estimate the economic benefit in today's terms.

Savings on surplus costs of education

Savings to the economy in the area of education reflects the economic value of the sum total of years in special education that are saved to the education system in the incremental early childhood investment scenario, in accordance with estimates found in the literature. In the analysis of Israel's data, approximately 14 percent of all pupils in the education system are in

special education.[33] Out of this group, it is assumed that approximately 69% of special-education pupils are affected with responsive disabilities (such as developmental delays, behavioral disorders/ADHD and learning disabilities), and could possibly be affected by further investment in education.[34] Due to the fact that the estimates found in the literature vis-a-vis the effect of early childhood investment are expressed in terms of savings on school years in special education, an estimate was made of the total number of years of special education for an age cohort in the Israeli population (181,000 people) at approximately 260,000 years.[35] The estimate of reduction of years in special education, in the incremental investment scenario that was calculated, is 4.5%, as was found in the literature and was adjusted for Israel,[36] meaning that in this scenario the education system saved approximately 12,000 years in special education for a single age cohort. The economic cost of those years that were saved is the surplus cost in a weighted-average scenario of the cost per year of integrated and unique schools (based on weights of the pupils) in relation to special education and are presented in 2019 prices.[37]

Savings on expenditures - savings on surplus costs of education

For the entire age cohort under examination

***** Calculated cost of integrated-school costs and special-education school costs, on the basis of varying percentage of pupils in each of the cases (among the pupils in special education: 66% integration, 34% special-education classes/schools)

[33] Weighted average of all levels of education, including preschool, primary and secondary; SFI adaptation of Central Bureau of Statistics data for 2018/19

[34] Special-education System, Knesset Research and Information Center, 2019

[35] Based on 15 years of study in the education system, including ages 3 to 6

[36] Barnett and Masse, 2007

[37] Special-education System, Knesset Research and Information Center, 2019

Savings on surplus costs of crime

The estimate of economic benefit as a result of savings on costs of crime is based on standardization of the average cost of crime per capita in the general population ages 15 to 65, between the years 2010-14, which is estimated at approximately 3,980 shekels per person, and calculates the increase in the GDP between 2014 (the last year for which costs of crime in Israel were published, by the Ministry of Internal Security) and 2019.[38] In order to assess the effect of early childhood incremental investment on reduction of crime in terms of Israel, a standardization of the rate of feasibility of criminal activity in the past decade (2010-19), as published by the Israel Police, and which amounts to about 4% over the course of 30 years (the time span of the analysis), with a standardized 40% recidivism rate.[39] The standardized crime rate is estimated at about 7%; the investment scenario will reduce that figure by about 2%, in accordance with the research literature that has been surveyed and adapted to the attributes of Israel.[40]

Savings on expenditures - savings on costs of crime

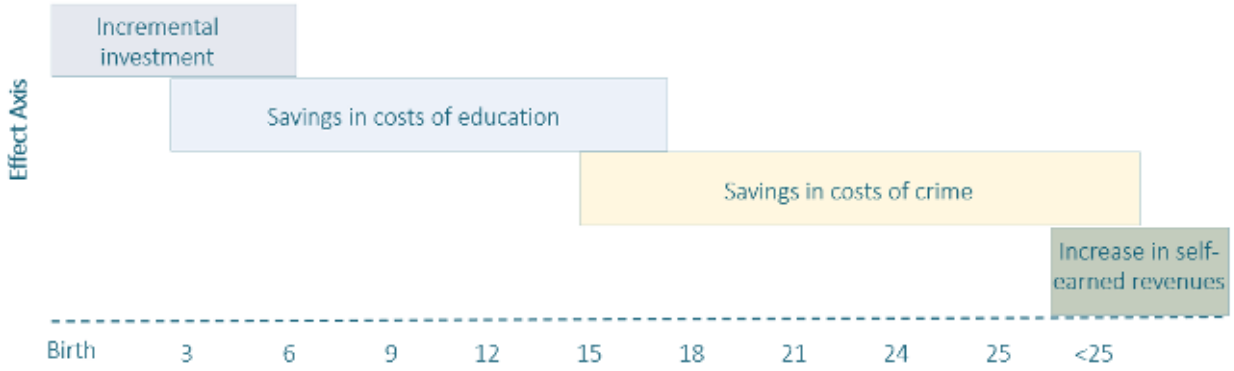
For the entire age cohort under examination

* Average costs of crime in Israel per person ages 15-65 in the years 2010-14, based on the report, 'The Economic Damage of the Phenomenon of Criminal Activity in Israel,' released in 2014 by the Ministry of Internal Security

Source: Average rate of criminal activity in Israel in the years 2010-19, based on the Statistical Yearbook of the Israel Police; percentage of reduction of criminal activity in the investment scenario, based on Reynolds, 2011

[38] Economic damage from the phenomenon of crime in Israel, Ministry of Internal Security, 2014; age-related population data of the Central Bureau of Statistics
[39] Israel Police, Statistical Yearbook, 2019
[40] Reynolds, 2011

Economic benefits in relation to ages of the age cohort (lifetime)



Potential savings on surplus costs of health

Savings on the costs of health, which have been analyzed in only two research studies, which engage in the benefit cost of early childhood investment, have not been calculated into this study due to a lack of significant estimation of the connection between early childhood investment and economic savings on health. It should be noted that in those studies that considered the issue, a reduction of smoking was found among boys who had completed specific early childhood programs, although no similar effect was found for the group of girls.[41]

Although the economic benefit of the health axis is not cited in this study, it may be assumed that enhancement of the response of the early childhood population in Israel, including greater attention paid to safe and clean learning and living environments, nutritional aspects, and a healthy lifestyle during childhood, would lead to significant health benefit in the short-term as well as in the long-term. This would in turn lead to an indirect economic benefit related to savings on health system expenditures and greater work productivity.

Additional evidence of the potential for economic savings in the health field is the link between the individual's level of education and their status, as cited in Central Bureau of Statistics data for 2018. [42] As this reference indicates, there is a strong link between early childhood

[41] The axes of effect cited in this study reflect the potential effects for which estimations were found and the research literature along with available data for the population in Israel. It should be noted that early childhood investment may have additional social and economic effects and compensations that are not cited in this study.
[42] Differences and the gaps in the population, according to level of education - selected data from the report; Aspects of Society, No. 12, December 2020, Central Bureau of Statistics

investment and level of education, which has in turn found to be in correlation with the individual's health condition. In a report on the state of society in Israel released by the Central Bureau of Statistics in 2020, it was found that among persons in possession of a matriculation certificate or who have not completed secondary school, there is a relatively high percentage of smokers (approximately 50 to 55%, as opposed to 45.8% among persons who have earned an academic degree). Obesity itself causes significant economic damage to the economy, which has been estimated by the Ministry of Health as costing 5.76 billion shekels per year, constituting nearly 10% of the annual national expenditure on health.[43] Smoking and obesity constitute major risk factors for morbidity, and are related to numerous diseases, including diabetes, heart disease and cancer, whose cost to the economy is estimated in the billions of shekels each year. [44] In spite of the indirect connection, in the absence of findings that directly and causally link early childhood investment to health, this element has been excluded from this study.

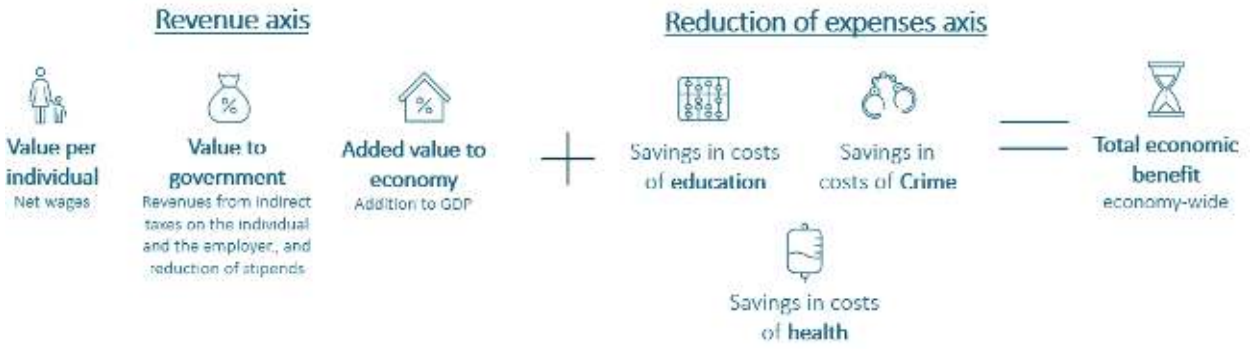
Therefore, this study is limited in its ability to assess the potential effect of early childhood incremental investment in the field of health, and it may be assumed that estimation of the benefit cited in this study is an underestimation that reflects only part of the picture. We must delve further into the analysis cited in long-term studies that are based on data that is adapted to the health system in Israel (in light of the quality and scope of the existing data in the Israeli health system, there is a high feasibility for this sort of high-quality research study) in which a direct link could be made to the effects of early childhood incremental investment on the health of the individual over time, and the attendant economic significance.

The following are the primary components of the study, which have been calculated as an analysis of the economic benefit of early childhood Investment:

[43] Health Behaviors, Prevention and Treatment of Obesity, Ministry of Health, 2011

[44] Aspects of Society, No. 12, Gaps according to level of education, health; December 2020, Central Bureau of Statistics; estimation of the cost of diabetes in Israel and understanding the significance of its prevention and the development of new financial tools for preventive medicine, the Israel National Institute for Health Policy Research, and the National Insurance Institute, 2018

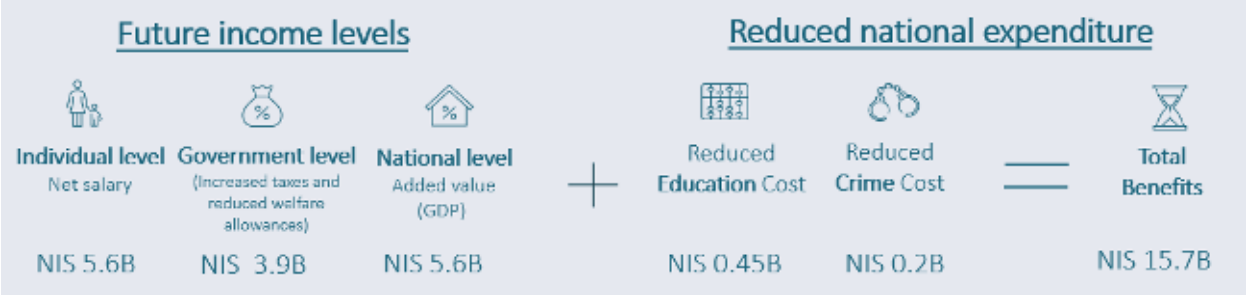
Primary components of economic benefit of early childhood investment in Israel



Main findings

The sum total economic benefit of early childhood investment in a single age cohort of the population is estimated at approximately 15.7 billion shekels, which reflects the total economic value created over the lifetime of an age cohort of the population and is equivalent to about 1% of the annual GDP in Israel. [45] Of the total economic benefits, approximately 15.1 billion shekels are on the revenues axis, and include approximately 5.6 billion shekels of value created to the individual (net wages), approximately 3.9 billion shekels of value created to the government as a result of increase in tax revenues and reduction of government allowances, and an additional approximately 5.6 billion shekels that reflect the added value created for the economy as a result of the increased GDP. In addition to the above, along the savings on expenditures axis, the savings on cost of education in the early childhood incremental investment scenario is estimated at about 0.45 billion shekels, and the savings on costs of crime is estimated at about 0.2 billion shekels. [46]

Sum total of economic benefit of early childhood investment



Economic benefit of incremental investment in early childhood in Israel

The sum total of benefits on the income from taxes reflects the economic benefit resulting from the increase in wages and the extent of employment deriving from the increased acquisition of postsecondary education and standardization of the unique attributes of groups in the population in Israel. The participation rates in the labor force, average wages and

[45] In relation to the 2019 GDP, according to Central Bureau of Statistics data

[46] The savings on cost of education referred to in this study reflect the national savings of the education system in the early childhood incremental investment scenario, and do not take into account the indirect potential savings of parents on supportive para-medical expenditures

percentage of workers with postsecondary education have been charted by sector and gender. Women from the Arab sector and men from the Ultra-Orthodox sector were excluded, under the assumption that participation in employment among these groups is in large part based on social aspects and norms and would not be affected by additional early childhood investment.

Attributes of the population in a representative age cohort, by sector

Thousands	**Population size** in age cohort (in thousands)	**% of cohort**	% of participation in workforce	%employed	**Will be employed, as percentage of age cohort**	of the employed with **postsecondary education**	**Average salary per month** without postsecondary education	**Average salary per month** in a postsecondary education scenario
Jewish (Deciles 1-5)	13	7%	75%	97%	9	43%	6.2	8.8
Jewish (Deciles 6-10)	86	48%	75%	95%	61	72%	-	-
Haredi sector	40	22%	61%	65%	16	18%	6.9	9.8
Arab sector	42	23%	47%	95%	19	37%	6.6	9.4
Total	181	100%	-	-	101	-	-	-

Source: SFI adaptation of Central Bureau of Statistics data

In analyzing the economic benefit on the revenues axis, subdivided by sector, the benefit primarily derives from the added value created within the Ultra-Orthodox and Arab sectors. Of the 15.1 billion shekels that represent the sum total of economic benefits on the revenues axis, approximately 2.9 billion shekels is the result of increased employment and wages in deciles 1-5 in the Jewish sector, 6.2 billion shekels in the Ultra-Orthodox sector and approximately 5.9 billion shekels in the Arab sector. These findings reflect the relative gaps in the rates of postsecondary education among the various sectors, participation rates in the workforce and the rates of employment referred to in the table above. Savings on expenditures of the education system and the cost of crime were estimated for the entire age cohort and were not subdivided at a sectoral or gender level; they reflect the average savings on each of the axes for a single age cohort.

Economic benefit, subdivided by sectors

In billions of NIS	Value per individual Net wage	Value to government revenues from indirect taxes on the individual and the employer, and reduction of stipends	Added value to economy Addition to GDP	Total economic benefit from increased revenues	Savings in costs of education	Savings in costs of crime	Total economic benefit economy-wide
Jewish sector (deciles 1-5)	1.1	0.9	1.0	2.9	0.45 Billion NIS	0.2 Billion NIS	15.7 billion NIS
Jewish sector (deciles 6-10)	-	-	-	-			
Haredi sector	2.3	1.5	2.4	6.2			
Arab sector	2.3	1.4	2.2	5.9			
Total economic benefit	5.6	3.9	5.6	15.1			

Estimation of the requisite incremental investment

At present, there is no consensus on the requisite scope of the additional budget needed to make it a more effective investment and thereby improve the quality of education and care frameworks for early childhood in Israel. Therefore, the estimated incremental cost of investment to generate a qualitative expansion of the response to early childhood in Israel has been based on the most up-to-date official estimate published by a relevant public body. To that end, we use an evaluation of the implementation cost of the supervisory regulations of daycare centers for toddlers, as presented by the Ministry of Labor, Social Welfare and Social Services to the conference on children's rights that was held in December 2020. The incremental cost, which was estimated at a one-time cost of approximately 75 million shekels and an annual cost of approximately 600 million shekels for licensed (*Semel* in Hebrew) and private daycare centers, includes regulations related to structural aspects (area, regulatory ratio, group size); in-service training for directors, caregivers and counselors; developmental-educational conduct in the daycare center; safety and reduction of risks and dangers; and expansion of communication and reporting to parents.[47] For the purpose of calculating the investment scenario in the age cohort examined in this study, it was assumed that this incremental investment would be required for a three-year period, for a single age cohort

[47] Supervisory regulations for daycare centers for toddlers, the Ministry of Labor and Social Welfare and Social Services, presented at the Special Committee for the Rights of the Child, December 2020.

between the ages of birth and 6 years (see 'Estimated Cost of Implementation' in the table below).[48]

In order to estimate the incremental investment cost for a single age cohort, with 100% coverage of the age cohort, the costs were standardized and represented in the table below. In order to estimate the incremental cost that would be required for an age cohort, the annual cost required for the daycare centers was divided by 3 (representing the average of 3 age cohorts at ages birth to 3 years) in order to make a conservative estimate of the investment that would be required for an age cohort at the ages of birth to 6 years, in which the one-time cost remains as it was, on the assumption that this cost represents required infrastructure investment that would not be affected by the range of children who would be recipients of the response (see ' Estimated cost per age cohort' in the table below).

Since only approximately 25% of children age birth to 3 years are found in frameworks operated by the Ministry of Labor, Social Welfare and Social Services, the total cost (including the one-time cost) was multiplied by 4, in order to cover 100% of the age cohort being tested, on the assumption that in a scenario of 100% coverage, expansion of the infrastructure would be required. This amount has been included in the one-time cost that has been presented.[49] In order to make as conservative an estimate as possible, it was assumed that the total costs presented (including the one-time cost) would be required for three years at the age range of birth to 6 years, to finance the required response (see 'Sum total cost of system for implementation' in the table below). [50] Based on this estimate, the sum total of requisite incremental cost is estimated at approximately 3.3 billion shekels per age cohort in the population, for the qualitative improvement of the response to toddler-age children over the

[48] A final estimate of the investment cost that would be required is based on the cost of extending the investment in ages birth to 3 years but was applied in this study to the cost required to expand the response to ages birth to 6 years, in accordance with what has been cited in this chapter in order to calculate a total of the cost required for a single age cohort in this age group. It may be assumed that this cost is conservative in terms of what is needed, due to the absence of investment in the Education- Care field that exists for children younger than age 3 in Israel.
[49] Frameworks for early-childhood children and governmental supervision on them, Knesset Research and Information Center, 2020

[50] It should be noted that the estimated cost of investment required was based on incremental investment over three years, as opposed to the programs surveyed in the research literature framework (and on the basis of the estimates presented in them this study was carried out), which took place over a period of between one and two years (see also Rand Corporation, 2016).

course of three years at the aforementioned range of ages.[51] In order to understand the magnitude, this cost estimate constitutes approximately 6% of the Ministry of Education budget, as published by the Ministry of Finance for the year 2019. [52]

Estimated cost of expanding the qualitative early childhood response in Israel

Billions of NIS	Estimated cost of implementation (officially recognized and private; 25% of all preschools)	Estimated cost per age cohort 3 age cohorts*	Total estimated cost of implementation (100% of the preschools, per age cohort)
One-time cost	0.075	0.075	0.30
Annual cost	0.6	0.2	0.8
Aggregated cost, NIS, Billions (3 years)	**1.9**	**0.7**	**3.3**

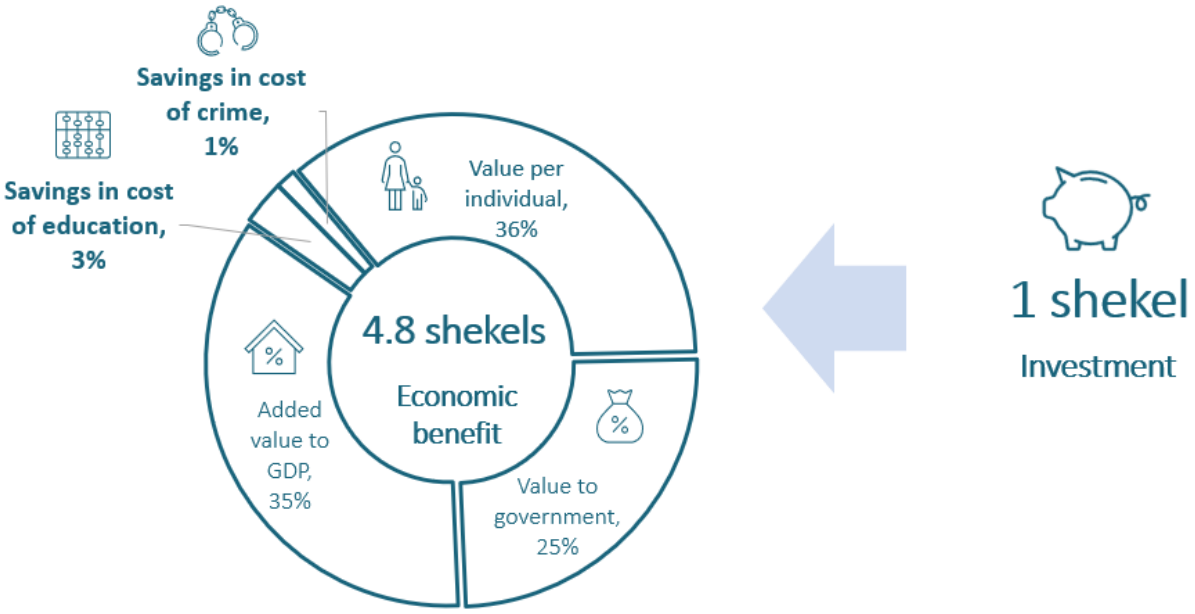
The effect multiplier of investment in early childhood

The ratio between the economic benefit of investment in age birth to 6 years, which amounts to approximately 15.7 billion shekels, and the required investment cost, estimated at approximately 3.3 billion shekels, reflects a cost-benefit ratio (effect multiplier) of about 4.8 shekels - in other words, for every shekel of investment in early childhood, economic benefit is produced at a value of about 4.8 shekels, of which 4.6 shekels are a result of the increase in income. The value created may be broken down between the individual (36%), the government (25%) and the remaining economy (35%), when the weight of the savings on expenses of education and crime amounts to approximately 4% of the value created.

[51] The cited cost estimate relates to incremental public Investments for the qualitative expansion of the response for early childhood, and does not relate to investment sources of the individual or to potential alternative sources of financing

[52] State Budget, Proposal for the 2019 fiscal year, Budget Division, Ministry of Finance

The effect multiplier of investment in early childhood in Israel



The multiplier reflects the ratio of the economic benefits that will be created over the course of 30 years, which constitutes a conservative estimate for the duration of average participation in the labor market in Israel, to the requisite investment. At the same time, in order to return said investment (a break-even scenario), it would require only five years of participation of the age cohort under examination in the labor market. Within five years, the improvement in wages, the employment rates, and the effects of these factors on the GNP (in accordance with the components of the "revenues axis") are expected to total up to approximately 3.5 billion shekels. Within 10 years of being part of the workforce, the return on investment is expected to nearly double itself, with the benefit for this period being estimated at approximately 6.5 billion shekels.[53]

It should be noted that we do not have in our possession the data required to accurately assess the linear nature of the incremental investment nor the benefit it might bestow (or generally speaking, to mathematically characterize the investment function). It may be assumed that there exists a minimal investment threshold that would be needed in order to create the investment effect, as it has been presented in this study. Nevertheless, it should be noted that

[53] At a discount rate of 5%

this study took as conservative an approach as possible, both in regard to the magnitude of the investment cost - in the framework of which it was assumed that the requisite one-time cost presented by the Ministry of Labor, Social Welfare and Social Services would be required at an annual level - and in regard to the duration of the requisite investment, which has been estimated at three years, even though the one-time cost to expand the education-care frameworks that were surveyed in the research literature (and on the basis of the estimates presented in them this study was carried out), took place over a period of between one and two years. [54]

Comparison of multipliers

In a global comparison, the multiplier effect in Israel that is solely associated with income (4.6) is similar to that of studies elsewhere in the world and reinforces the credibility of the research findings in the Israeli case. Israel's overall multiplier, part of which is the savings on the expenditure's axis, is significantly lower than findings elsewhere in the world. This variance is likely to be a byproduct of the variance of the components that were included in the framework of the savings on expenditures axis, the variance that may be found between observations and estimates, attributes of the population in studies (general population as opposed to at-risk populations) and the relatively low rate of crime in Israel, as opposed to the United States.

[54] For more detail, see the chapter 'Estimation of the requisite incremental investment'; For additional information on the duration of these programs in the research literature, see Rand Corporation, 2016

Comparison of multipliers in relation to findings from around the world

Year of Publication	Total Multiplier	
2011	10.8	CPC, Chicago
2015	8.6	Office of the President of the United States
2016	7.3	National Bureau of Economic Research, U.S.
2021	**4.8**	**SFI – JDC – Ashalim**

Year of Publication	Revenue Multiplier	
2013	5.9	Oklahoma and Georgia, U.S.
2021	**4.6**	**SFI – JDC – Ashalim**
2015	4.4	Office of the President of the United States
2012	3.7	Tulsa program – Half days
2011	3.4	CPC – Chicago
2012	3.1	Tulsa program – Full days
2010	1.6	Head start program

Sensitivity scenarios

In order to analyze the sensitivity of the findings and of the cost-benefit ratio of early childhood investment in Israel to multiple assumptions, various scenarios were tested, and the multiplier effects (cost-benefit ratio) were evaluated in relation to changes and cost of the requisite incremental Investment, rate of growth of post-secondary education, and discount rate. In all of the scenarios that were analyzed, the multiplier effect had a positive ratio, with a multiplier effect of 2 (i.e., a benefit of 2 shekels for every 1 shekel of investment) and the maximum multiplier amounted to approximately 10.5 (a benefit of 10.5 shekels for every 1 shekel of investment). Findings of the sensitivity scenarios are presented in the tables below.

Limitations of the research study

The objective of this research study is to assess the economic benefits that would result from incremental investment that would broaden the qualitative response to early childhood in Israel. This study does not aspire to define the composition of the requisite incremental investments in order to generate high-quality frameworks in Israel, or to define high-quality education for early childhood, in part because there is no uniform consensus in the research literature or among professional interests regarding the early childhood investment component that would lead to maximization of the social and economic benefit. For that purpose, a fundamental examination would have to be made of available alternatives for a high-quality response, as well as the requisite incremental investment, and measurement of the manner in

which they affect the situation over time, in accordance with the composition of the population in Israel. Similarly, this study does not engage in the benefits that are likely to derive from a quantitative expansion of the frameworks that now exist for early childhood-age children in Israel, which is likely to have an effect on the parents' integration into the labor market, and in turn on the value created to the economy. It should be stressed that the analysis estimates the value that would be created from incremental investment at ages birth to 6 years, above and beyond the value that is created by present-day investment in kindergartens and supervised daycare centers. Therefore, the base scenario and starting point of this study is the existing investment in these ages at the time that the study was conducted. The starting assumption in this analysis is that in the absence of incremental investment and its attendant benefits, which are presented in this document, the existing situation will remain as it is.

There are various existing funding models that can be adopted for funding incremental investments in early childhood, as referenced in this document, and it may be assumed that the funding model that will be chosen will affect the market of early childhood frameworks, government budget, public debt, rate of taxation, and parents' private sources of funding. The analysis presented in this document relates to the economic value produced for the entire national economy as a result of broadening of the qualitative response to early childhood, and does not take into account how the sources and the type of funding may affect the existing supply, such as the ability of existing private programs to compete or of future private frameworks to be established, as well as the incentivization of these frameworks to affect a qualitative broadening of existing frameworks. That being the case, mapping and analysis of the type of financing and the composition of the investment are broad issues that are not introduced in this study. They are likely to complete the picture on the investment side (cost, including financing costs, and not benefit), in order to evaluate which financing model might lead to the most beneficial results, in a manner that is adjusted to existing regulation in Israel.

Early childhood investment that leads to higher levels of education and earning power has an attendant intergenerational effect, as has been demonstrated in the World Economic Forum's social mobility model. Thus, the future children of those who will receive high-quality frameworks in their early childhood would, with great likelihood, receive better, higher-quality education and care frameworks compared to the existing alternative, which would be attended

by long-term economic benefits. These intergenerational effects are not calculated into this study, although it may be assumed that the cumulative benefits would resonate, like echoes of incremental investment. However, they have not been included in the economic and social benefits presented in this study.

Conclusion

This study aspires to broaden the discourse and offer economic information on the benefit of investment in early childhood in Israel. Its findings reflect the viability of incremental investment in early childhood, in socioeconomic terms - both for the individual and for society and the economy in general. This study is unique in the field of early childhood in Israel, in terms of its appraisal of the economic benefits of investment in the education of children of early childhood age. Its objective is to impart additional tools to be used in future planning and maximizing of the economic and social value of investments in this area. We do not disregard the budgetary challenge that is part and parcel of any investment that yields long-term economic benefit, and it is also the case for investment in early childhood. Nevertheless, in light of the findings arising from this study and from the global literature on the subject, along with the educational and employment-related challenges faced by Israeli society and the accelerated and consistent growth rate of the population, long-term planning and investment is needed to promote the abilities, skills and productivity of the individual in society, strengthening of the social infrastructures, and the potential for social mobility in Israel.

Long-term studies have not been carried out in Israel, even though they might be able to provide substantive evidence of the expected economic benefits of investment in early childhood. Overall, throughout our research process, the researchers confronted a significant lack of data about the children, their parents, and the frameworks and education-care-health programs available to children of early childhood age in Israel, including the connection between these and various socioeconomic and geographical attributes, and the dearth of long-term studies that might analyze the development and trends of axes over time. This study is based on estimations derived from global literature, and its findings, which are presented here, constitute an evaluation of the potential economic benefit of this sort of investment.

The absence of data on early childhood is related, on the one hand, to the challenges of measurement posed by the existing system and its attributes, and on the other hand, the potential for sensitivity and educational complexity that attends the direct measurement of the accomplishments of children, kindergarten teachers and frameworks for this age group. Indirect measurement processes ought to be considered, in which the quality of early childhood frameworks could be measured, including the pedagogical climate and environment,

education and training of kindergarten teachers and daycare workers, and soft, supporting aspects. Nevertheless, we should develop standardized diagnostic tools for follow-up and evaluation of the development and advancement of early childhood. Such standardization would make systematic data collection possible for the sake of long-term comparison, in different towns and cities or in the diverse residential scenarios in Israel.

In addition to this data, more thorough observation of the findings needs to be carried out: for instance, data amassed by the Central Bureau of Statistics, such as socioeconomic status, sectoral affiliation, parents' education and employment should be incorporated, as well as data from the Ministry of Social Welfare, other government ministries and the Health Funds system. Additionally, we should consider how it would be possible, in a short period of time, to expand health-outcomes monitoring among children in the early childhood group for health aspects with long-term implications and for which information is readily available, and possibly extend its focus to include indices of obesity and developmental delays. This would enable greater understanding of the need and effectiveness of existing responses, in order to evaluate the potential health benefit of incremental investment in early childhood. By means of gathering and cross-checking these data over time, it would be possible to make a more grounded estimation of the health axis, directly link the effects of incremental investment in early childhood with the long-term health of the individual and identify its attendant economic significance.

The lack of data prevents precise evaluation of the situation, hampering our ability to identify the contexts and circumstances that might explain the situation and what might be the optimal and specific solution to the Israeli case. By means of systematic and extensive data collection, and the weighing of alternatives to the type of investments and how they will affect the situation over time, it would be possible to analyze the optimal investment configuration from among the existing options, with the aim of fostering an optimal social and economic shift over time, and adoption of a specific incremental investment, and to better understand the primary variables that affect the situation in Israel.

Early childhood incremental Investment, which would advance high-quality education-care frameworks for population groups in need, would have the potential to promote social mobility in Israel. Although the entire population in Israel would derive benefits from early childhood

incremental investment, the major advances could be expected to be made among weakened population groups and households living below the poverty line. To that end, what is required is a deepening of the differential approach in the framework of incremental investment, one that would be adapted to the population in Israel, its attributes, and its needs.

The multiplier effect that has been demonstrated is found for the uniform and continuous incremental investment in the population of Israel, but it can be assumed that the multiplier effect would be higher in economic terms among weakened population groups, who would enjoy significant social benefits, including the narrowing of gaps and the promotion of social mobility.

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