



Economic Effects of Investment in a Metro System On Productivity and GDP

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This is a short summary, for the full paper (in Hebrew) see
<https://www.idc.ac.il/he/research/aiep/pages/policy-papers.aspx>.

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The state of transportation infrastructures in Israel lags significantly behind that of most developed countries. An OECD report found that the roads in Israel are the most congested among developed countries, while only a quarter of Israelis use public transport (compared to 60% globally), and in 20 years the daily duration of commuting is projected to increase by 60 minutes for the average commuter (OECD, 2018). According to estimates, the setback in public infrastructure per capita in Israel, particularly transportation infrastructure, accounts for around 24% of the productivity gaps between Israel and the group of countries it was compared to (Eckstein and Lifschitz, 2017).

Over the last decade, the Israeli government has invested in the road infrastructure in Israel, to accommodate the increase in the number of vehicles. However, despite this substantial investment, travel time by both private and public modes of transportation has not been reduced. The Israeli economy suffers from inefficient public transport consisting of low capacity busses, and the accessibility of public transport decreases as you get farther away from city centers (Sofer and Suhoy, 2019).

In 2015, the Israeli government initiated the construction of a mass transport system, which currently consists of the Red Line. However, it is already clear that the light rail is not a long-term solution for increasing the capacity of the transportation system. Some voices claim that policy efforts should be limited hereafter to traffic congestion management, through the imposition of congestion charges. We assert that those measures should be complementary to a developed metro network. In the absence of a metro network, congestion charges will damage the GDP as well as economic welfare.

Road congestion has a high economic cost. This cost is measured in terms of car accidents, air pollution, loss of working hours, and so forth. In addition, economic literature highlights the agglomeration effects of efficient transportation, which helps improving productivity by increasing the effective density of metropolitan areas. Lack of transportation makes it difficult for workers to reach employment hubs, constricts movement between business hubs during the workday, and drives up the cost of freight transport, which is a critical factor for various industries. Lack of transportation acts as a barrier to agglomeration of businesses and to effective utilization of the benefits of scale and variety, and carries a high economic cost manifested in GDP loss.

A large body of research literature on this subject shows that concentration and agglomeration of businesses lead to an increase in GDP per worker, wages, research activity, and the number of patents issued. According to empirical literature, the world's largest metropolitan areas are characterized by high productivity. An OECD study on the return on agglomeration found that in all the countries examined, the GDP per worker was significantly higher in dense cities compared to cities with lower density in the same country (OECD, 2017). In this paper we show that investment in an efficient transport system in the form of a metro network in the Tel Aviv metropolitan area (AKA "Gush Dan"), amounting to NIS 150 billion and accompanied by a suitable policy for densification of population and employment, will raise the overall GDP per worker by 1.1-4.5 percent. The annual GDP increase caused by investment in a metro network due to agglomeration effect only, compared to the default alternative of maintaining business as usual, is estimated according to this study at between NIS billion 27-100, beginning upon completion of the project.

The last year saw a broad public debate on the feasibility of investment in a metro network for metropolitan Tel Aviv. The discussion tends to focus mostly on the direct effects of the metro system on socioeconomic welfare, while disregarding the indirect impact on labor productivity. In this paper we calculate the projected indirect effects of the planned metro network on the GDP due to increased densification of workers and businesses. We assert that the currently used assessments of the GDP impact of agglomeration are conservative and undervalued. Furthermore, maximizing the GDP impact of the metro network requires enactment of a suitable housing policy, which might leverage the GDP impact of the metro network.

The housing policy implemented over the past few decades has severely restricted construction in high-demand areas, aiming to disperse the population in peripheral regions. This policy impaired the densification of population and businesses and had a negative impact on labor productivity. In our view, the required policy should encourage densification of population and employment in business hubs, in order to utilize the benefits of agglomeration. This goal can be achieved by enacting an appropriate planning policy, and by boosting existing policies of urban renewal (Evacuation and Reconstruction, National Outline Plan 38/2).

We also recommend increasing the density of population and employment – through transport policies accompanied by complementary housing policies – in other metropolitan areas, such as Be'er Sheva, Haifa, and Jerusalem. The current population dispersal trend in Israel's metropolitan areas impairs the potential for metropolitan development. At this stage

we have not calculated the economic benefits for other metropolitan areas apart from Tel Aviv, due to a lack of reliable data, but we believe that business agglomeration in other metropolitan areas in Israel, according to the principles laid out in this paper, would make it possible to create a critical mass and to increase productivity and wages in other metropolitan areas besides greater Tel Aviv.