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Executive Summary

Evaluating Direct and Indirect Benefits of Green Office Buildings in Israel

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This paper evaluates the business case for the construction of green office buildings while quantifying the benefits – both direct and indirect – resulting from improved indoor environmental quality (IEQ). Green building construction provides both direct and indirect benefits: direct benefits mainly include savings on operating and maintenance costs; and indirect benefits affect building users by reducing illness, curtailing employee turnover and absence, increasing personal and organizational productivity, and boosting overall satisfaction. While there is difficulty in quantifying these benefits, studies conducted worldwide indicate that green office buildings increase productivity and improve the health and wellbeing of the buildings' users. Given the fact that direct savings in operating and maintenance costs of green office buildings constitute only a small fraction of their overall economic benefits, the business case for green building construction is overwhelming.

Research Question

- How can the indirect benefits of building green office buildings be evaluated to calculate the return on investment?
- What are the indirect benefits associated with green office buildings in relation to conventional office buildings?

Research Structure

The first chapter of this paper provides a literature review that establishes the theoretical basis for the positive effect that green buildings have on their users because of higher IEQ. The second chapter presents an economic model that estimates the benefits and costs of green building construction, the net present value of constructing green office buildings in Israel, and the return on additional investment that green construction requires. In addition, the model estimates the macroeconomic impact of green building on workforce productivity in the Israeli market. The discussion section in the third chapter presents additional data regarding green building sector: the reduction of healthcare expenditures due to green building; mapping the value chain of economic stakeholders in the green building market; an overview of the barriers to implementing green building in Israel; and the business case for green employment buildings on the basis of data regarding the scope of the office market in Israel. In the conclusions chapter, the paper recommends policy measures to overcome existing barriers and areas for follow-up research.

Based on international experience of green building, outlined in the literature review, the economic model presented in this paper evaluates Israel's increased adoption of green construction techniques in the value of economic output, welfare, and health using the method of benefit transfer. By transferring the benefits, the net present value of green building adoption can be

estimated, along with the return on investment. The analysis show that a modest estimate of a 3% increase in productivity that can be attributed to green building, together with an average monthly productivity of NIS 37,100 per employee (NIS 445,700 per year), results in an annual production increase of approximately NIS 13,400 per employee, or NIS 669 per square meter, and over NIS 12.5 million for the structure shown in the reference study. This increase in productivity adds about NIS 11.5 billion per year to the Israeli economy. In Israel, high-productivity industries (such as finance, insurance, real estate, and business services) are relatively large and account for one-third economy's total productivity. Low-productivity sectors such as wholesale and retail trade are relatively small. Owing to their dominant presence, an increase in the high-productivity industries' productivity would be highly significant and beneficial to Israeli economy. This increase might narrow the gap in productivity between Israel and the rest of the developed countries in the OECD.

In many cases, cost-benefit analyses of green building do not differentiate between those who bear costs and those who benefit, making identifying the market failure difficult. This is a challenge when building green building economic models and mapping the value-chain of stakeholders. The increase in productivity that the economic model offers might be beneficial for the tenant, but not for the building owner, except when they are one and the same (a situation that is uncommon in Israel). In the event in which the owner is not the tenant, it is assumed that the increased output will be compensated by higher rent and property value, shorter marketing time, etc. so that the profit will be for both the lessee and the owner.

Several factors account for this market failure in Israel. First, the Israeli real estate market is largely controlled by companies that build income-producing real estate as an investment (for both sale and rental). Few of these properties are designated for entrepreneurs' own use. Second, there is a lack of information on several levels:

1. The investor market (entrepreneurs) is currently unable to reflect all the green building benefits in the rental price of the assets, thereby reaping a higher yield.
2. The tenant market is unable to choose an improved product because it lacks knowledge about the significance and value of green office buildings.
3. The market is not efficient enough to quantify all the costs and benefits of green building.

In the event of failure in the green building market, the State of Israel must intervene and encourage investment in this type of construction to improve the health and productivity of its residents. Since the main obstacle today is lack of knowledge, this paper recommends that the State provide resources to increase awareness of and access to the information regarding of green building techniques to dispel the uncertainty regarding economic viability of green construction.

It is also important to note that economic viability varies not only according to stakeholders, but also by type of structure. As this research shows, a green office is economically viable due to improved employee productivity. A green school, however, does not necessarily gain financial return on its investment due to better academic performance of the students. Therefore, diverse types of government support are needed to promote green building in different sectors. Understanding both the types of costs and benefits and their distribution among the various stakeholders is essential to identifying the incentives of each, and to formulating an efficient and effective public policy (see Kot and Katz, 2013).

The paper further recommends that the Israel consider policies to encourage the renovation and conversion of existing structures to green buildings. The surplus of office space supply in Israel, particularly in the country's center, may provide an opportunity to advance quality green construction. Excess supply in the coming years will force entrepreneurs to compete for each tenant. Therefore, developers should consider converting existing old office spaces into green buildings to attract high-quality tenants.. With the cost of the conversion being relatively low, and considering its many benefits, this type of construction has great viability.

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