Foreign Policy at BROOKINGS

POLICY BRIEF

MIGRANTS AND THE STARTUP NATION: ADDRESSING ISRAEL'S GROWING DEMAND FOR SKILLS BY INCREASING THE COUNTRY'S ROLE IN THE DEVELOPING WORLD

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DECEMBER 2018

EXECUTIVE SUMMARY

Israel has experienced a structural transformation process that is worthy of studying: from an economy highly reliant on agriculture, to a service-oriented system, and then a net exporter of high-tech manufacturing. This economic growth has gone hand-in-hand with the development of its innovation ecosystem for which the country came to be known as the "Startup Nation." Today, Israel boasts the largest availability of venture capital as a share of its GDP, making it, for this and other reasons, one of the best locations to create and develop highly innovative startup firms. Israel also places second in the world in terms of research and development (R&D) expenditures relative to its GDP (only recently outdone by South Korea), and is home to R&D facilities of numerous large technology firms from all over the world.

Yet, recently Israel has been facing a problem that might constrain the further development of its fast-growing high-tech sector in the short term: the country cannot keep pace with the growing demand from the high-tech sector for software engineers and other computer-related occupations. The Israeli Innovation Authority (formerly known as the Office of the Chief Scientist of the Ministry of Economy) estimates that over the next decade there will be a shortage of 10,000 engineers and programmers for a growing information and communication technology (ICT) industry that, as of 2018, employs roughly 180,000 workers.[1]

This, of course, is a "good problem" to have; yet, it is of big concern for policymakers in the country, given that current and future economic growth in Israel depends, to a large extent, on the success of its robust and growing high-tech sector.

All the while, Israel faces a seemingly unrelated challenge: an unfulfilled desire to become a main player in assisting developing countries to eliminate poverty and achieve sustainable economic growth. Israel's official development agency, MASHAV, has stood out by training more than 300,000 individuals from developing countries in areas such as agriculture and irrigation, among others.[2] However, in the absence of large budgets that would allow Israel to play a more significant role as a provider of foreign aid, particularly in a new era where many developing countries have moved toward service-oriented economies, there might be other ways—perhaps more effective and scalable ones—through which Israel can play a more central role in providing development assistance.

In this brief, I argue that the challenges related to the short-term shortage of engineering-related workers in Israel can also be an opportunity for the country to directly contribute to the developing world. In particular, I propose that the shortage of workers in computer-related occupations could be

temporarily assuaged by offering short-term visas for highly skilled laborers from developing nations with a background in engineering and computer science. Indeed, this solution has already been devised by the Israeli government, but the implementation of this program could fill two gaps. First, it will diminish possible growth constraints to the high-tech sector due to a shortage of talent, and at the same time, it will foster knowledge transfer between Israel and the developing world through those same workers, thereby expanding its contribution to the developing world.

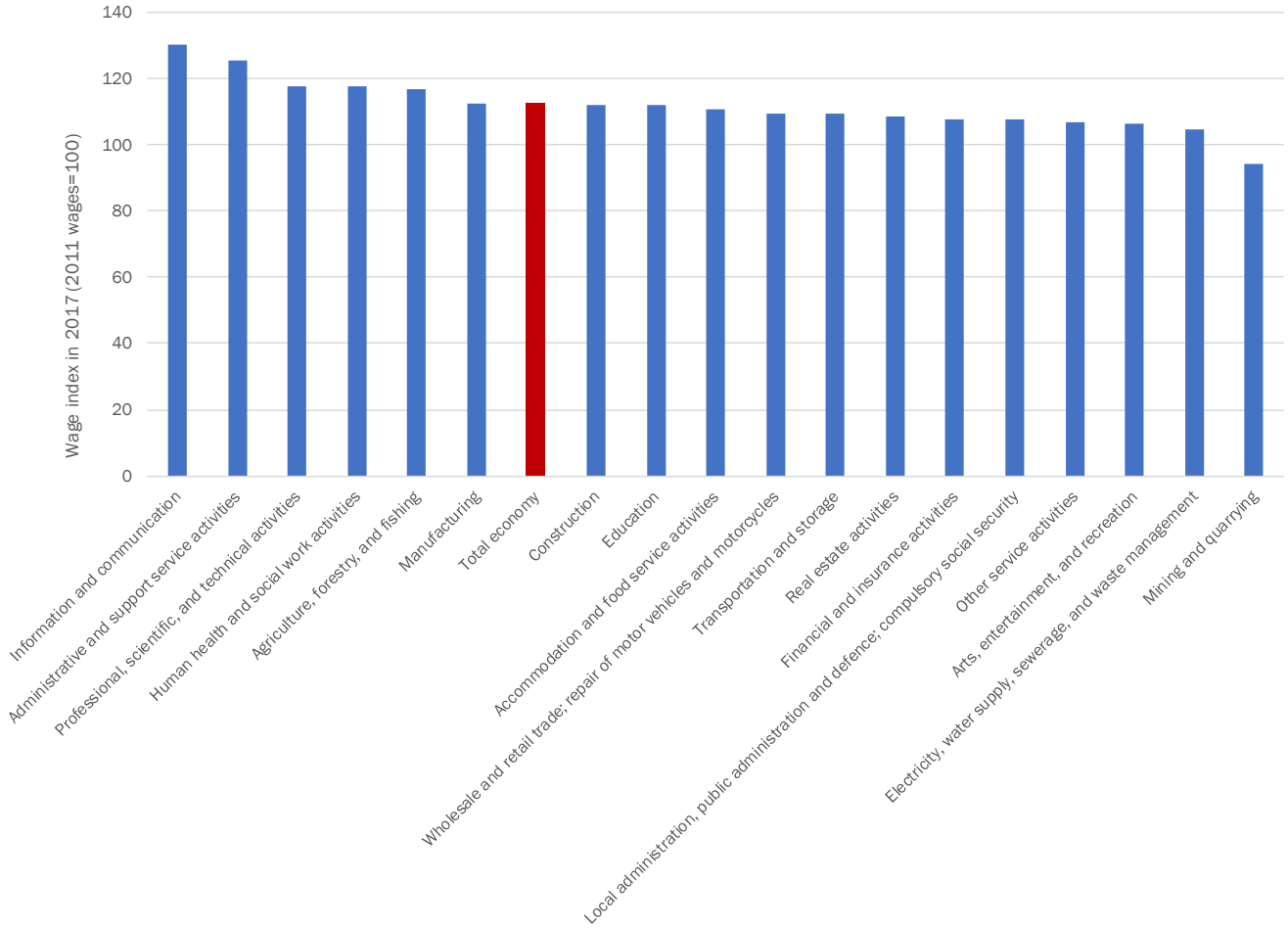
ISRAEL'S HIGH-TECH SECTOR AND TALENT SHORTAGES

By 2017, Israel's information and communications technologies sector (ICT) represented about 7.2 percent of its GDP but 20 percent of its exports of goods and services.[3] In 2011, it represented 14.8 percent of all exports, implying over a 30 percent growth rate in only six years. Without a doubt, the ICT sector in Israel is one of the strongest engines of its economy. This is evidenced by many other important indicators: Israel has the highest level of investment in venture capital in the Organization for Economic Co-Operation and Development (OECD) at 0.4 percent of GDP; 9.3 percent of all R&D is performed by firms below five years of age; and, notably, in 2015 the level of labor productivity in Israel's ICT sector was more than double the rest of the business sector.[4]

Therefore, any constraints on the ability of the sector to keep growing, caused by coordination failures or other types of market failures, should be addressed. A recent report by Israel's Innovation Agency outlines future challenges for the high-tech sector, the most glaring of which is a shortage of qualified job applicants, both for high-end engineers (in computer hardware and software development) as well as in positions geared toward vocational graduates, such as engineer technicians.[5] This notion, in fact, is backed up by the data.

Figure 1 presents 2017 real wages among workers in different sectors of the Israeli economy, indexed by their value in 2011 being equal to 100 (e.g., 125 means that the real wage in 2017 is 25 percent higher than in 2011), using data from Israel's Central Bureau of Statistics. For the overall economy, there was an increase of about 12 percent in real wages between 2011 and 2017, whereas for the ICT sector, the increase was of 30 percent, the highest among all sectors of the economy. Fast wage growth is a sign of demand growing faster than supply, and therefore it is a crucial indicator of labor shortages in the ICT sector.

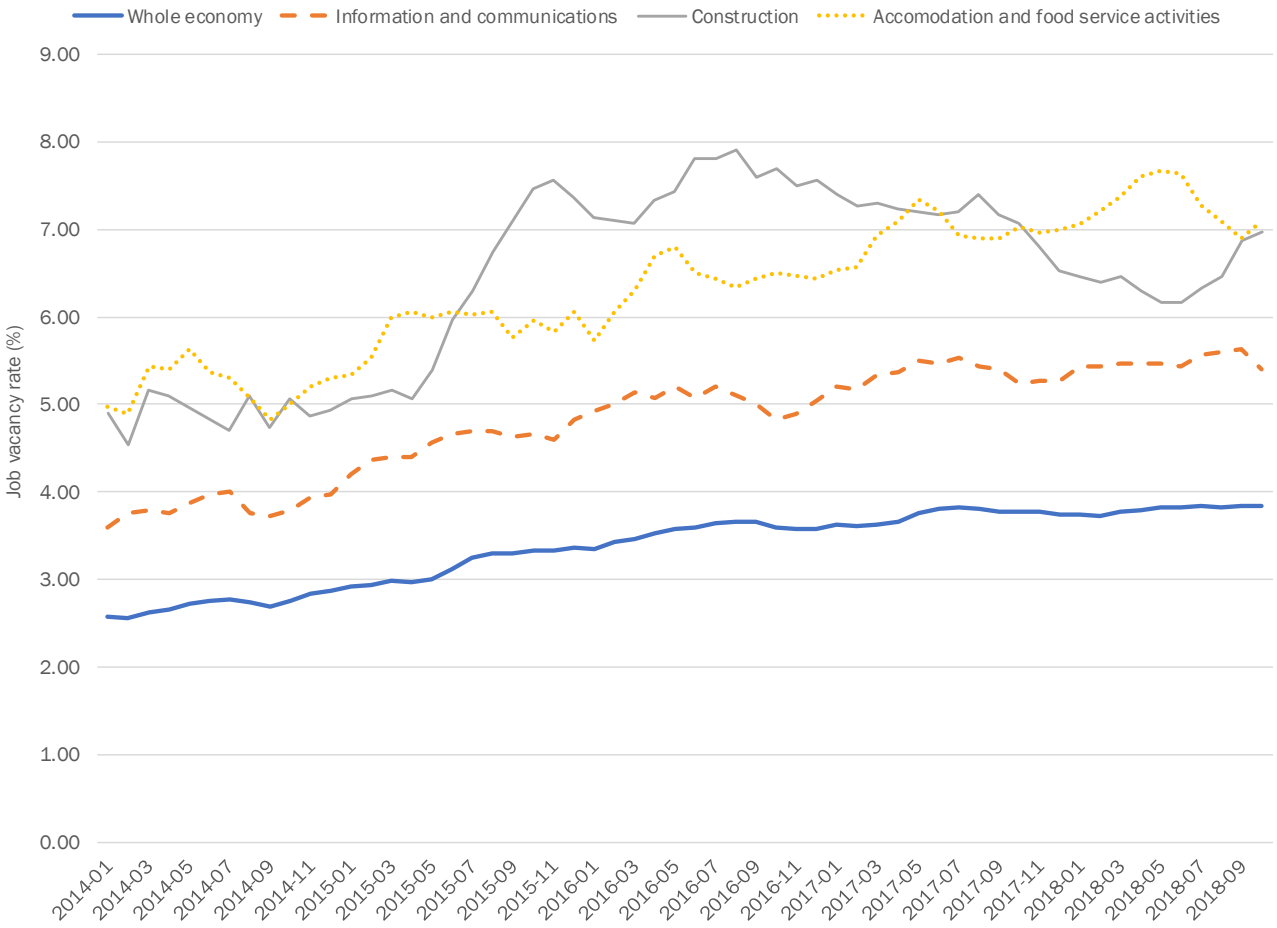
FIGURE 1: ISRAEL MEAN REAL WAGE INDEX BY INDUSTRY



Source: Israel Central Bureau of Statistics

Note that other sectors also represent important increases in wages, but more evidence keeps pointing to the problem of labor shortages being particularly important for the ICT sector. For example, examining the Job Vacancy Rate (JVR) calculated by Israel's Central Bureau of Statistics can help us complete the picture. The JVR is, simply put, the percentage of vacancies given the total number of positions—filled and unfilled—in the sector. A high and growing JVR implies a growing demand of workers in the sector. Figure 2 plots the JVR for the whole economy, as well as for the top three sectors with the highest JVR by the third quarter of 2018.

FIGURE 2: ISRAEL JOB VACANCY RATES, WHOLE ECONOMY AND SELECTED SECTORS



Source: Israel Central Bureau of Statistics

As plotted in the figure, the ICT sector's JVR is went from 3.6 percent to in early 2014 to 5.4 percent in the third quarter of 2018 (a 50 percent increase), as compared to the overall economy's JVR which stands at 3.8 percent. There are other sectors in the economy with a higher JVR than ICT, such as construction and the tourism/restaurant sector, but the wages in those sectors—as evidenced in Figure 1—have not been increasing as much. Thus, the high JVR for those sectors might reflect the simple fact that these are industries where the turnover is relatively higher than the average. This interpretation is consistent with the idea that, as opposed to the ICT sector, the other two high JVR industries employ a large proportion of low-skilled workers, and tend to have higher turnover rates.

Another important data point that reinforces this fact is the recent report by the Central Bureau of Statistics examining the supply and demand ratio for different occupations, which represents the ratio between job applicants and job vacancies. For the overall economy, this ratio decreased to 3.2 in the second quarter of 2018, down from 3.4 in the previous quarter. This means that in the Israeli economy there are 3.2 times applications for every vacancy in the economy. However, when digging into certain occupations, the picture can be quite different. When focusing on ICT's essential occupations, the report finds that the supply to demand ratio among software developers decreased to 0.4 in the second quarter of 2018, as compared with 0.6 in the previous quarter. That is, there is less than half an application for every software developer vacancy in Israel.[6]

The government of Israel is acutely aware of this problem. In early 2017, it approved a program to address the shortage of workers in ICT-related occupations, to be implemented in conjunction with

the Israel Innovation Authority (IIA). The program included allocating funds for opening vocational high schools to produce more workers with engineering skills, as well as "importing" qualified workers to address the shortages in the very short term.[7]

In May 2018, the official procedures for handling special visa applications was released by the government's Population and Migration Authority.[8] The procedures explain how high-tech firms can request foreign workers to join their companies for one year. The special visa is only available to firms in the ICT sector, and for hiring workers that would earn twice the average salary in the market (as measured by government agencies).

There still remain some open questions about how this process will work. On one hand, the creation of a special visa status that differs from the already existing "foreign expert worker visa" is a positive, as it is meant to ease the process both for firms and applicants by cutting red tape in the process. On the other hand, the procedures are unclear on certain important aspects. For instance, the program seems to limit the duration of the visa to only one year, which seems like a short period of time both for the worker and the firm. In addition, the student track—where foreign students in Israel can also apply for the visa after graduating and if they have a job offer in hand—limits the number of applicants to 500 at any given time. The procedures for the traditional "foreign expert worker visa," released in June of 2018, specifies that visas will be issued for two years, with the possibility to renew for up to one extra year after that.[9] It is unclear whether the ICT workers' visa will allow for renewal based on this more general prescription.

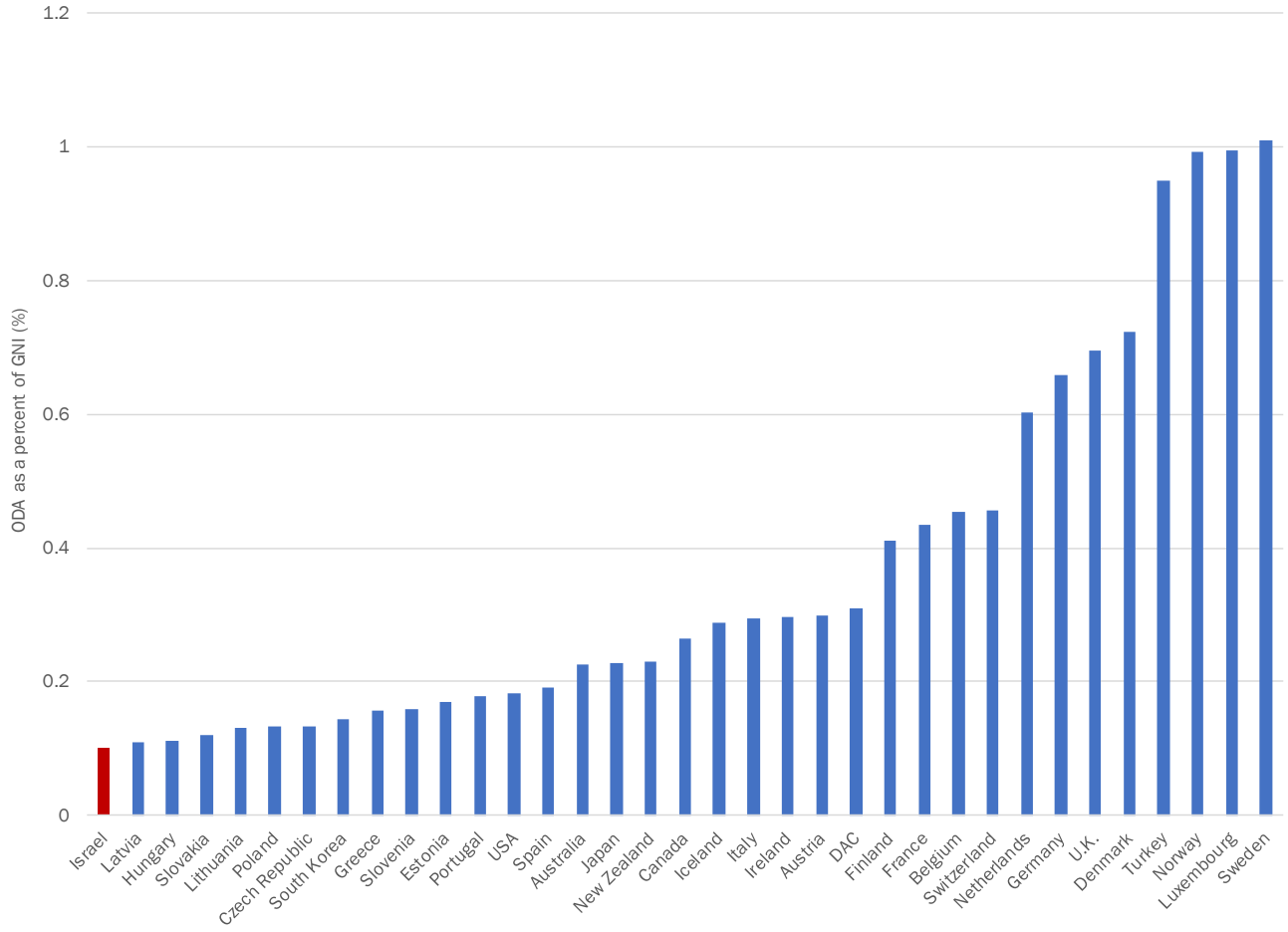
Given the high demand for workers and the nature of the industry, and the investment firms of this type make in their workers, it would be important to relax some of the limitations in this original design.

ISRAEL'S LIMITED INVOLVEMENT IN THE DEVELOPING WORLD

Israel's Agency for International Development Cooperation, named MASHAV, is responsible for extending a hand to the developing world, a goal assigned to it by founding Prime Minister David Ben-Gurion, who claimed that "development cooperation is both a moral and a political issue."

Since its inception, MASHAV has trained over 300,000 citizens of developing countries in areas where Israel can offer expertise, such as gender empowerment, paramedicine, agriculture, water conservation, irrigation, and management skills. Yet, Israel still lags behind in terms of the budgets available for official development assistance (ODA). In 2017, according to OECD data, Israel's total disbursements of ODA reached $274 million—about 0.1 percent of its gross national income—way below the 0.7 percent target set by the Pearson Commission in 1969.[10] As can be seen in Figure 3, Israel is the smaller donor—in proportion to its economy—among all OECD countries.

FIGURE 3: OFFICIAL DEVELOPMENT ASSISTANCE (%GNI) AMONG OECD COUNTRIES IN 2017



Source: Organization for Economic Co-Operation and Development

Perhaps precisely because of the important limitations of Israel in terms of ODA, MASHAV has devoted itself to training individuals in developing countries. This is quite an important task, but its reach is still limited by budgetary constraints as well as the capacity of the government to scale-up its efforts significantly. Without certain partnerships with the private sector, this seems like a difficult proposition.

Yet, MASHAV has incorporated some strategies to join forces with the private sector and increase Israel's footprint in the developing world. The most notable of all is the program Etgar ("challenge" in Hebrew), jointly implemented by MASHAV and the IIA. This program aims to provide a government contribution of up to 90 percent of private firms' R&D expenditures related to providing solutions to health-related challenges in developing countries (up to a maximum of roughly $150,000). This new scheme is part of a very generous and large portfolio of IIA programs that contribute to private R&D in the country, often considered among the determinants of the success of Israel's ICT sector.

This partnership just shows the important role that Israel's ICT sector could play as a force for development around the globe.

LINKING TWO SEEMINGLY UNRELATED POLICY OBJECTIVES

The shortage of available talent to fill job vacancies in Israel's ICT sector is an opportunity for the country to increase its footprint when it comes to assisting developing countries, particularly those going through structural transformations toward service-oriented economies.

While making up for the shortages in the high-tech sector by employing temporary skilled laborers from developing countries, Israel would also significantly contribute to the development process of these nations by fostering the spread of ideas, knowledge, and technology through the migrants themselves, upon their return.

After having spent some years in Israel working for leading ICT firms, these workers will take home know-how that could result in higher productivity in the firms they end up working for upon their return, or potentially, in new firms they create. This know-how would not be intellectual property from the firms they worked for while in Israel, but rather lessons in terms of management and productivity-enhancing techniques and ideas. Intellectual property is to be protected by the firm, in the same way it is protected when hiring any employee.

The notion that migrants facilitate the transfer of know-how across borders, which is reflected in development outcomes, is an idea backed by several recent studies linking migration to economic development. Bahar and Rapoport, for example, show that the emergence of new export sectors is more likely with emigrants living in countries where that same sector is competitive.[11] Furthermore, Bahar et al. evidence that Yugoslavian migrants and refugees, following a short stay in Germany during the Balkan wars of the early 1990s, positively affected the performance of export sectors in Yugoslavia for which they worked while in Germany.[12] The study further shows that this effect is much stronger in knowledge-intensive sectors (such as ICT) and for migrants in skilled occupations (such as software engineers). In addition, Khanna and Morales show that the flourishing ICT sector in the United States and the existence of the H1B visa program—which has allowed many Indian software engineers work in U.S. firms—resulted in an increase in ICT-related professionals in India (through students choosing software-related programs), which in turn resulted in higher productivity in the Indian ICT sector.[13]

Naturally, a significant pool of potential applicants from developing countries with ICT-related skills is readily available in countries such as India and China. In 2016, China had 4.7 million recent science, technology, engineering, and mathematics (STEM) graduates, while India had 2.6 million (the United States had only 568,000).[14] The talent, however, could be also in other developing regions, such as Latin America, and to a lesser extent Africa, which also suffers from important talent shortages.

Note that this brief does not advocate for governments choosing workers on behalf of private firms. Rather, a natural way to link the two strategic objectives of dealing with talent shortages while increasing Israel's footprint in the developing world could be the creation of a scheme to incentivize firms to hire workers from developing nations. After all, as noted before, there are already ongoing government efforts to contribute to private R&D efforts to solve problems in those countries. Possible designs for this scheme could include special tax credits for ICT firms hiring workers from developing nations or a more aggressive incentive such as the government matching (a small) part of the salary given by the firm to the worker. The optimal design to do this will depend on preliminary agreements between institutions such as the IIA, MASHAV, and the private sector.

Some economists, however, could argue that the implementation of such a policy is unnecessary as it does not address any particular market failure, and might crowd out private investment or expenditure (e.g., it would be a waste of public resources if the private sector were to hire the same individual in the absence of a policy). While this is a legitimate argument, it is not completely accurate. The process of recruiting workers is full of information asymmetries between the firm and the employee (a typical market failure), let alone when recruiting foreign workers. In particular, the problem might be accentuated when recruiting foreign workers from developing countries, where there might be less confidence among firms on inputs to the hiring process (such as legal documentation), and workers might be less knowledgeable of the opportunities abroad, for instance given the higher barriers in terms of communication. The creation of a public-

private partnership to incentivize recruiting talent from developing countries could thus become an important tool to achieve the goal.

Note that, a priori, there is no evidence to think that the government can and should play a role on the "supply side," and thus the policy is not aimed to incentivize workers from developing countries to apply for jobs in Israel; the higher wages in Israel will probably be the main driver, and that is defined by the markets. However, the policy argument is meant to address the "demand side" by incentivizing Israeli firms to look for workers in developing countries where the companies would likely face important recruitment costs and, overall, severe information asymmetry issues (as opposed to when hiring from a place like Europe where informal social and professional networks are perhaps stronger and already in place, therefore reducing those hurdles).

In addition to this, it is important not to underestimate other ways through which the temporary inflow of foreign talent—even from developing countries—could benefit the Israeli economy. For instance, Alesina et al. show how birthplace diversity of the workforce explains higher future economic growth rates.[15] Moreover, it is indisputable that part of what makes the ICT sector successful in countries like the United States is the foreign talent that it attracts. In his recent book, Bill Kerr surveys research showing how high-skilled migration has been instrumental in driving economic prosperity in the United States. For instance, between 1975 and 2015 the share of U.S.-based patents attributed to inventors with Anglo-Saxon and European names dropped from over 91 to 72 percent.[16] The decline is explained by significant rise in the number of patents filed by inventors coming from China and Indian ethnicity, as well as other ethnic groups such as Korean and Hispanic inventors. Kerr also shows how migrants are a key driver of entrepreneurship rates in the United States, fueling local economic growth. Therefore, Israel opening its doors to attract high-skilled talent can be highly beneficial for an ICT sector that needs more global talent to remain on the cutting edge.

Finally, decades of research in international economics have shown how migrants reduce information costs between countries boosting bilateral trade and investment.[17] Thus, in order for Israel to be more integrated with foreign markets beyond the United States and Europe, these temporary and circular migration flows can be crucial.

CONCLUSION

All in all, the Israeli economy could always benefit from opening its doors to temporary and circular migration, in order to benefit from the flow of global talent. As it is argued in this brief, the government's policy of "importing" workers with ICT-related skills to address labor shortages in the Israeli economy is a step in the right direction.

This policy, however, has potential to also help expand Israel's footprint in the developing world by intensifying efforts to attract talent from developing countries and regions (India, China, Latin America, and some African countries). These efforts should come from a public-private partnership between Israel's private sector community, the country's international development agency, MASHAV, and the Israel Innovation Authority.

Judging by the significant backlash against globalization and, perhaps more saliently, against migration in Western countries, this could be a sensitive policy to implement in Israel. In fact, Israel recently decided to pull out of the U.N. Global Compact on Migration, which ironically provides a platform to collaborate with other states on issues like labor shortages.[18] However, if such a policy would be put into place, the ability of these temporary migrants from developing countries to contribute to their local economies upon their return, after having spent a few years working for Israeli ICT firms, is perhaps the most effective way through which Israel can contribute to the development process of these nations.

Perhaps as importantly, the diversity of the talent being added to the Israeli ICT sector has the potential to further fuel the industry, as is the case in the tech-leading cities in the United States.

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ACKNOWLEDGEMENTS

The author thanks Natan Sachs, director of the Brookings Center for Middle East Policy, for his comments on an earlier draft of this paper. In addition, he thanks Yael Mizrahi-Arnaud for her help in earlier stages of this paper. He is also grateful to Avi Simhon, head of the National Economic Council (NEC) at the Israeli Prime Minister's Office for his interest as well as to Ayelet Shpaier, senior economist at the NEC for thoughtful conversations. Views expressed in the paper represent those of the author only.