

Chapter 5

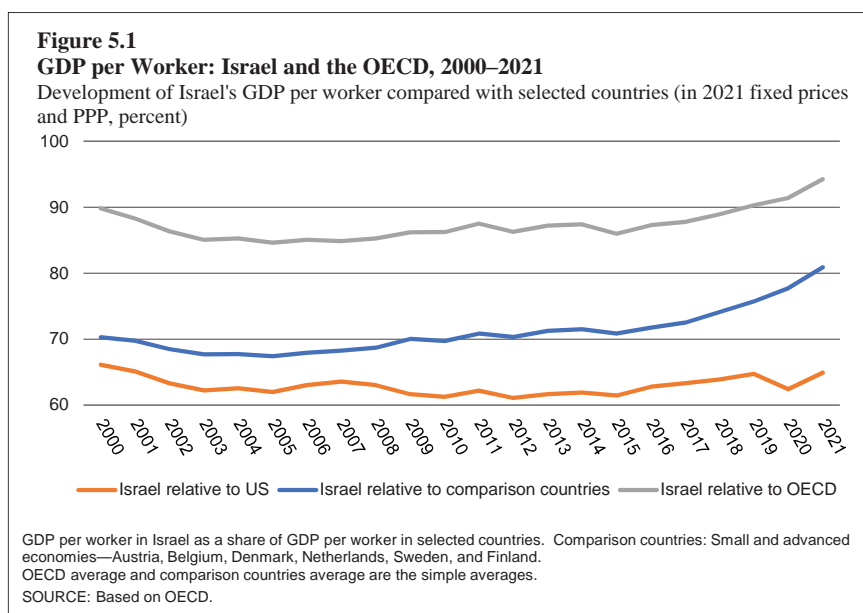
Labor Productivity in Israel in the Past Decade

- The growth of GDP per worker (labor productivity) in Israel accelerated in the past decade, and the gaps relative to other OECD countries have begun to narrow. This trend intensified with the exit from the COVID-19 crisis.
- The growth of economy-wide productivity in the past decade was mainly due to an increase in industry productivity, particularly in the services industries. In contrast, the change in the distribution of employees among the industries made almost no contribution.
- By international comparison, the change in productivity in the Israeli services industries made a larger contribution than the OECD average, thanks to a greater increase in productivity in the Israeli services industries and due to their greater weight in GDP.
- The increases in productivity and employment in the services industries were not only due to the activity of the high-tech sector, but also encompassed additional industries. Productivity in the trade, communications, and banking industries increased due to streamlining as a result of reforms to encourage competition, as well as improved service through the implementation of online technologies.

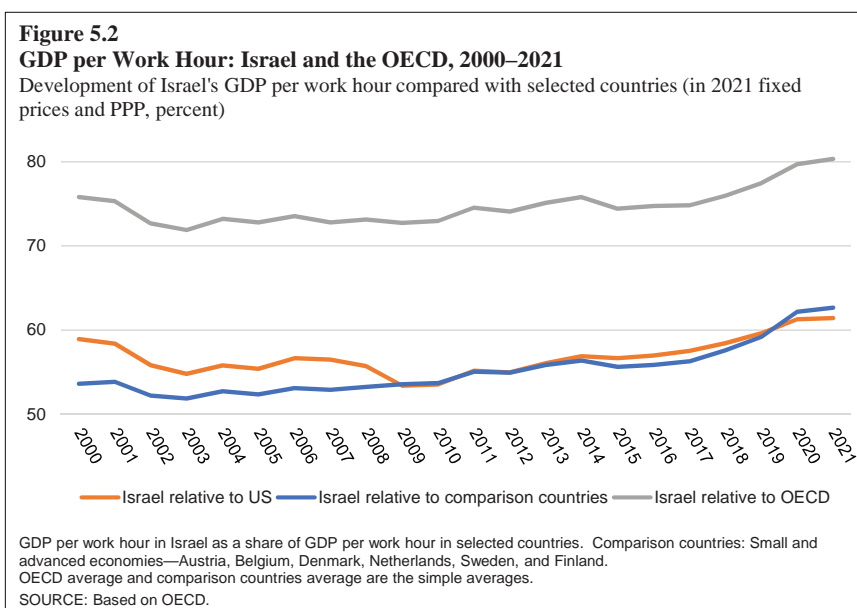
Labor productivity (gross domestic product per worker or per work hour) that is lower than the OECD average has been one of the fundamental problems of the Israeli economy. The Bank of Israel's Research Department has attributed tremendous importance to the issue over the years, and has published comprehensive research studies about it, including various policy recommendations.¹ Labor productivity reflects the economy's production capacity through a given labor force—hence its importance. The more workers' output increases, the higher the country's standard of living (per capita GDP) is, and the higher real wages are. Understanding the processes and the factors that affect economy-wide labor productivity are essential for improving the standard of living and promoting sustainable economic growth.

In the past decade, the growth of labor productivity (GDP per worker) has accelerated, and the gap relative to other advanced economies has narrowed.

Following two decades in which the gap in labor productivity (GDP per worker) between Israel and other advanced economies remained steady or widened, the pace of increase in labor productivity in Israel accelerated in the past decade. At first, the acceleration was moderate, but in the second half of the decade, it was more rapid, and the gap relative to other advanced economies narrowed (Figure 5.1). The stronger recovery of the Israeli economy, and of labor productivity in Israel, following the COVID-19 crisis strengthened this trend. A similar conclusion is derived when looking at the changes in GDP per work hour (Figure 5.2).



¹ See: “Research Department Special Report: Raising the Standard of Living in Israel by Increasing Labor Productivity” (2019); “Four Recommended Pillars of Strategic Government Action to Accelerate Economic Growth and a Fiscal Framework for Financing Them” (2021); and “Recommended Strategic Pillars of Action for the Government” (2023).



In this Chapter, we examine the development of labor productivity (GDP per worker) in Israel over the past two decades compared with other advanced economies, looking at both industry productivity and the industry structure of the economy (distribution of employees among industries). Since economy-wide labor productivity is an average of the labor productivity of the various industries weighted by the rate of employees in each industry as a share of total employees in the economy, we distinguish the contribution of the improvement in labor productivity within the industries (“intra-industry contribution”) from the contribution of the change in the industry structure of the economy—the change in the distribution of employees in the various industries (“inter-industry contribution”).

Empirical studies point to systematic differences between countries in how the industry structure and labor productivity develop in different industries. The process of structural change is similar among countries, but differs in timing and speed of occurrence. In advanced economies, the process is reflected in a decline in the share of manufacturing industries in favor of services industries. A number of explanations for the structural change process are offered. One explanation on the demand side is that the increase in the standard of living changes private consumption patterns in favor of higher consumption of services.² The effect of such a process on economy-wide productivity depends on the productivity of the services industries relative to that of manufacturing. On the supply side, one explanation states that the manufacturing industries’ high exposure to international competition, technological changes, and streamlining processes leads to an increase in productivity, but also to a lower number

Labor productivity in the economy is examined while distinguishing between the contribution of industry productivity and the contribution of the change in the distribution of employees between industries.

² See D. A. Comin, D. Lashkari, and M. Mesieri (2021). “Structural Change with Long-Run Income and Price Effects”, *Econometrica*, 89(1): 311–374, which analyzes the effects of changes in private consumption patterns.

of employees in those industries.³ Another reason for the structure change is an increase in the labor force participation rate, which focused on professions in the services industries.⁴

This structural change may be an important source of economic growth if it improves the allocation of sources in the economy and includes the movement of workers from industries with low productivity to ones with high productivity. In other words: The transition may increase productivity if the growing industries are based on more efficient firms. However, since there are a number of reasons for employees' movement, the contribution of structural change to economy-wide productivity growth is not necessarily positive. Moreover, employee movement from one industry to another does not change the human capital they bring with them, which affects labor productivity. A structural change may also reflect changes in the supply of labor, such as an increase in the labor force participation rate, due to the entry of workers with low skills and low earning capacity—an increase that contributes to GDP but reduces average labor productivity.

This analysis examines productivity growth from an industry perspective, separating the contribution of structural change from the contribution of the change in GDP per worker in the industries themselves. For this purpose, we break down productivity growth into two components according to the following formula:⁵

$$\Delta Y_t = \sum_{i=n} \theta_{i,t-k} \Delta y_{i,t} + \sum_{i=n} y_{i,t} \Delta \theta_{i,t}$$

where Y_t and $y_{i,t}$ relate to economy-wide and industry labor productivity (GDP per worker) respectively, $\theta_{i,t}$ denotes the rate of employees in industry i as a share of all employees in the economy, and represents the difference between the beginning and end of the period. The first expression in the equation reflects the contribution of the change in industry productivity, weighted by the share of employees in each industry at the beginning of the period. The second expression reflects the contribution of the

³ There are a number of studies outlining these processes. One examines the function of human capital in the growth of GDP per worker in the services industries: F.J. Buera and J.P. Kaboski (2012). “The Rise of the Service Economy”, *American Economic Review*, 102(6): 2540–2569. Another discusses how technological changes affect structural change: H. Herrendorf, C. Herrington, and A. Valentinyi (2015). “Sectoral Technology and Structural Transformation”, *American Economic Journal: Macroeconomics*, 7(4): 104–133.

⁴ Goldin (1995) examines the effects of women's increased labor force participation on the development of structural changes: C. Goldin (1995). “The U-Shaped Female Labor Force Function in Economic Development and Economic History”, in T.P. Schultz (ed.) “Investment in Women's Human Capital and Economic Development”, University of Chicago Press, pp. 61–90.

⁵ Found, for example, in M.S. McMillan, D. Rodrik, and C. Sepulveda (2017). “Structural Change, Fundamentals, and Growth: A Framework and Case Studies”, International Food Policy Research Institute, and World Bank, Washington DC.

The process of structural change does not necessarily contribute to productivity growth. The process makes a positive contribution to productivity growth only if the growing industries are based on more efficient firms.

change in the industry structure derived from the change in the distribution of workers among the industries, weighted by the industry productivity at the end of the period.

In the past two decades, the Israeli economy, as well as those of other countries, has been affected by various global processes that may have an impact on labor productivity. These include the global intensification of demand for digital services, which has increased the activity of the high-tech sector; the removal of limitations on imports; the advancement of regulatory leniencies to make it easier to do business; and the removal of barriers from the financial system, which has made it easier for foreign investors to enter Israel's financial markets and increased the availability of capital for businesses. Since these processes should affect industry labor productivity and the distribution of workers among industries in the Israeli and other economies in various ways, we examine how the state of the economy has changed during the period relative to other economies.

The database that is used includes data on employment and labor productivity, and is measured using value added per employee in dollars, in Israel and in about 30 other OECD countries. The analysis at the main industry level covers the years 2000–2019. Due to data limitations, the analysis at the two-digit industry level covers only 42 industries (which produce about 90 percent of business output), and relates to a smaller range of years (2012–2018). The source of the data on the other OECD countries is the OECD.stats database. Due to partial data on Israel in this database, the data at higher detail levels are taken from the Central Bureau of Statistics, and processed at the Bank of Israel. All value-added data are in fixed prices, and translated to US dollars by the PPP rate of general GDP for 2015.⁶

1. THE DEVELOPMENT OF LABOR PRODUCTIVITY BETWEEN 2000 AND 2019—MAIN INDUSTRIES AND INDUSTRY AGGREGATES

We first examine the long-term trends over the past two decades for the manufacturing, agriculture, and services industries in Israel compared to the OECD average, divided into two periods—2000–2010 and 2010–2019 (excluding the COVID-19 crisis of 2020–2021), presented in Figure 5.3.⁷ The economy-wide labor productivity growth path in this Figure is in line with the path presented in Figure 5.1. Labor productivity growth in these industries in Israel was moderate at the beginning of the 2000s (8.6 percent), and strengthened over the past decade (22.4 percent), which is unlike the trend in the other countries (19.6 percent and 13.3 percent respectively).

The Figure shows that the contribution of productivity growth in the manufacturing and agriculture industries to economy-wide productivity declined between the periods, both in Israel and in the OECD average. At the same time, the contribution

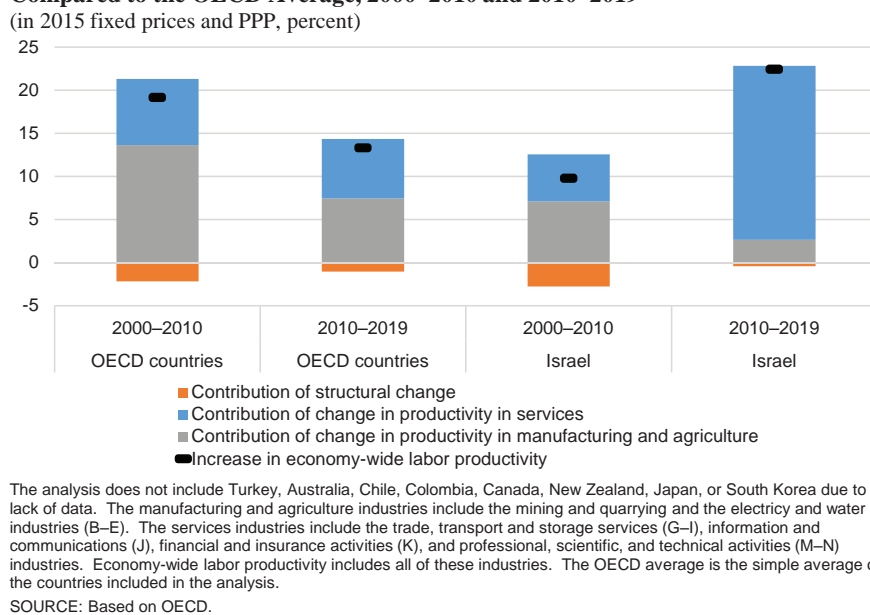
In the past two decades, the contribution of labor productivity in the manufacturing and agriculture industries to economy-wide productivity has declined, and the contribution of increased productivity in the services industries has grown. Structural change made almost no contribution to the increase in economy-wide labor productivity.

⁶ For more on the structure of the data, see Appendix A5.1

⁷ The services industries: trade; transport and storage services; accommodation and food services; information and communications; financial and insurance services; professional and scientific services; and management and support services. The manufacturing and agriculture industries also include the mining and quarrying industry and the electricity and water industry.

of increased productivity in the services industries grew in Israel, while the average contribution was stable in the other OECD countries. With regard to the industry structure of the economy, the rate of employees in the services industries relative to the manufacturing and agriculture industries, increased in Israel. This was in line with the long-term global trends documented in the economic literature. Since workers moved between industries with similar productivity levels at the end of the period (on average), the structural change made almost no contribution to the increase in economy-wide labor productivity.

Figure 5.3
Contribution of the Change in Industries' Productivity and Structure to the Change in Economy-Wide Labor Productivity, Selected Business Sector Industries, Israel Compared to the OECD Average, 2000–2010 and 2010–2019
 (in 2015 fixed prices and PPP, percent)



2. THE DEVELOPMENT OF LABOR PRODUCTIVITY BETWEEN 2012 AND 2018 IN INDUSTRIES THAT WERE EXAMINED AT AN EXPANDED DETAIL LEVEL

In view of the above analysis, we try to understand why the change in the productivity of the services industries made a greater contribution by international comparison. Due to data limitations, the analysis at the higher detail level relates, as stated, to the years 2012–2018 only.

We first examine labor productivity and the rate of employees divided into the trade and services industries and the manufacturing industries (Table 5.1). At the end of the period, labor productivity in the services industries in Israel was similar to the OECD average (the ratio between labor productivity in Israel and in the OECD increased

from 92 percent to 100 percent). At the same time, productivity in the manufacturing industries was lower (the ratio declined from 102 percent to 89 percent). The rate of employees in the manufacturing industries in Israel, which was lower than the OECD average, declined even more, while the rate of employees in the trade and services industries increased.

Table 5.1
Labor productivity and the distribution of employees in selected business sector industries, Israel and OECD, 2012–2018

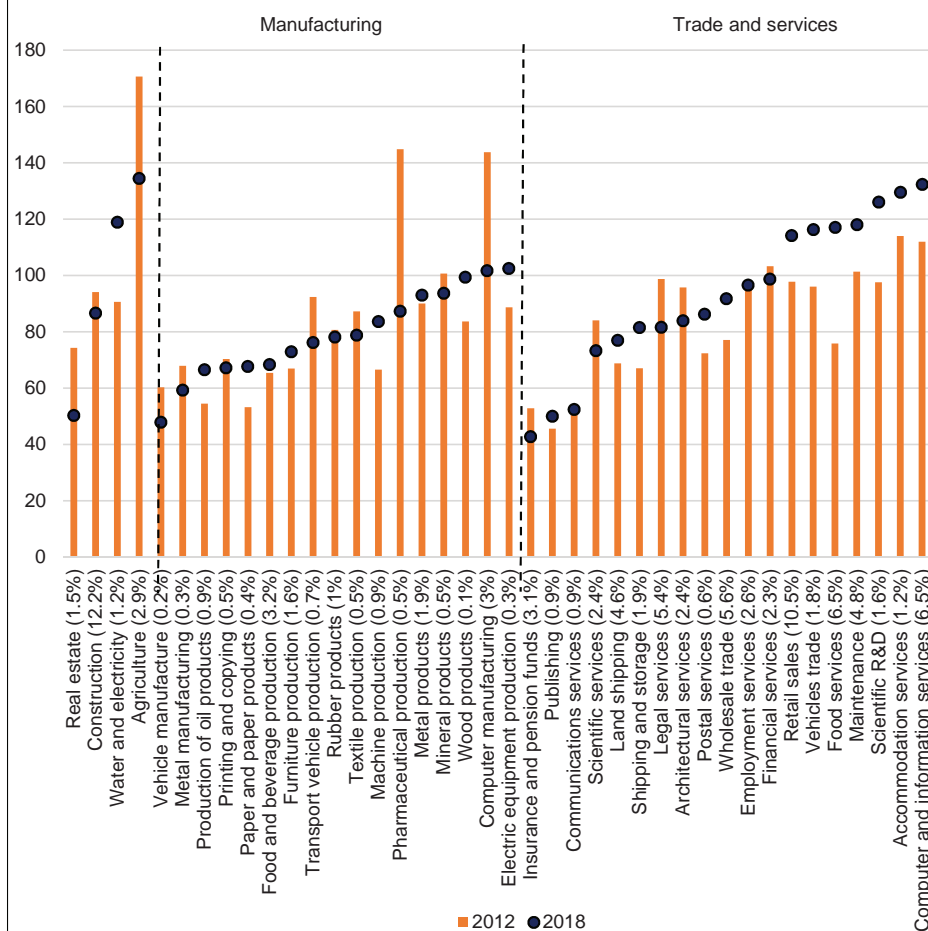
		Manufacturing		Trade and services	
		2012	2018	2012	2018
Israel	Percentage of employees	19.2	17.6	66.7	67.1
	Labor productivity (\$ thousand)	89	88	65	77
OECD average	Percentage of employees	22.4	21.9	59.8	61.6
	Labor productivity (\$ thousand)	87	98	71	77

The OECD average is the simple average of the countries included in the analysis. The analysis does not include Australia, Chile, Colombia, Costa Rica, Ireland, Japan, or Luxembourg. In some industries up to 2 additional countries were omitted due to a lack of itemized industry details. In some countries, up to 4 industries that appear in the analysis were omitted. All of the industries in the analysis cover about 90 percent of business sector output. GDP per worker is in fixed PPP for 2015. SOURCE: Based on OECD and Central Bureau of Statistics.

Figure 5.4 shows the ratio of industry productivity in Israel—industry productivity compared to the OECD average—at the beginning and at the end of the sample period. We find that there are large differences in the industry productivity gaps between the Israeli economy and the OECD average, which were extensively documented in previous papers.⁸ In general, the tradable industries, including the high-tech sector and the high and mixed-high technology manufacturing industries, enjoy a higher productivity ratio. Previous studies even found that in these industries, the rate of skilled workers is higher by international comparison, as is investment in physical capital as a share of GDP compared to parallel industries in other advanced economies.

⁸ Studies that examined productivity in Israel relative to the average of the advanced economies are included in: Bank of Israel, Annual Report for 2012 (Chapter 2); Bank of Israel, Annual Report for 2013 (Chapter 2); and Bank of Israel, “Research Department Special Report: Raising the Standard of Living in Israel by Increasing Labor Productivity” (2019). Another paper examined the changes in the high-tech industry and their contribution to productivity: G. Brand (2017). “Why Does Productivity in the Start-Up Nation Remain Low?” Taub Center for Social Policy Studies in Israel, Policy Paper number 06.2017.

Figure 5.4
Industry Productivity Ratio, Selected Business Sector Industries, Israel Compared to the OECD Average, 2012–2018 (GDP per worker, in 2015 fixed prices and PPP, percent)



Industry GDP per worker in Israel as a share of industry GDP per worker in the OECD countries. The analysis does not include Australia, Chile, Colombia, Costa Rica, Ireland, Japan, or Luxembourg. In some industries up to 2 additional countries were omitted due to a lack of itemized industry details. In some countries, up to 4 industries that appear in the analysis were omitted. The mining and quarrying industry is included in the analysis but does not appear in the Figure. All of the industries in the analysis cover about 90 percent of business sector output. The numbers appearing alongside the industry names denote the percentage of employees in the industry as a share of the employees in the industries included in the analysis.

OECD average is the simple average of the countries included in the analysis.

SOURCE: Based on OECD and Central Bureau of Statistics.

A comparison of the change in industry productivity in Israel relative to the OECD average between the two periods indicates an increase in labor productivity in most of the services industries, and mixed trends in the manufacturing and

agriculture industries (Figure 5.4).⁹ The growth in productivity of the computer and information services industry and of the information and development industry, which are included in the high-tech sector, was higher than in other countries. The same was true of growth in productivity of the accommodation and food services industry and the trade, finance, and insurance industries, where steps were taken in the past decade to increase competition and to increase online services.¹⁰ In contrast with the improvement in these industries, a number of industries lost their relative standing. The decline in relative industry productivity was prominent in a number of manufacturing industries, including pharmaceuticals—perhaps in view of the crisis encountered by some companies in the industry—and the computers and electronics industry after it accelerated rapidly at the beginning of the decade due to the increase in production capacity of the microchip industry.

Figure 5.5 shows the change in the industry distribution of employment between 2012 and 2018 in Israel and in the OECD average. Most of the changes were in the services industries, while most of the manufacturing and agriculture industries shows moderate declines in the employee rates, both in Israel and in the other countries. Another finding presented in the Figure is that despite the correlation between the change in Israel's industry distribution of employees and the change in the other countries, the volume of transitions between the services industries themselves in Israel was higher.¹¹ It is interesting to see that employment in Israel increases not only in the computer and information services industry, thanks to increasing global demand, but also in the services industries that serve the domestic market, such as legal, accounting, and administrative consulting services, scientific and technical publication services, and architecture and engineering services. In contrast, employment in some of the manufacturing and service industries declined in view of the increase in the volume of online trade and services, streamlining processes, and reforms to encourage competition (in the computers and electronics, communications, financial and insurance activities, and retail trade industries).

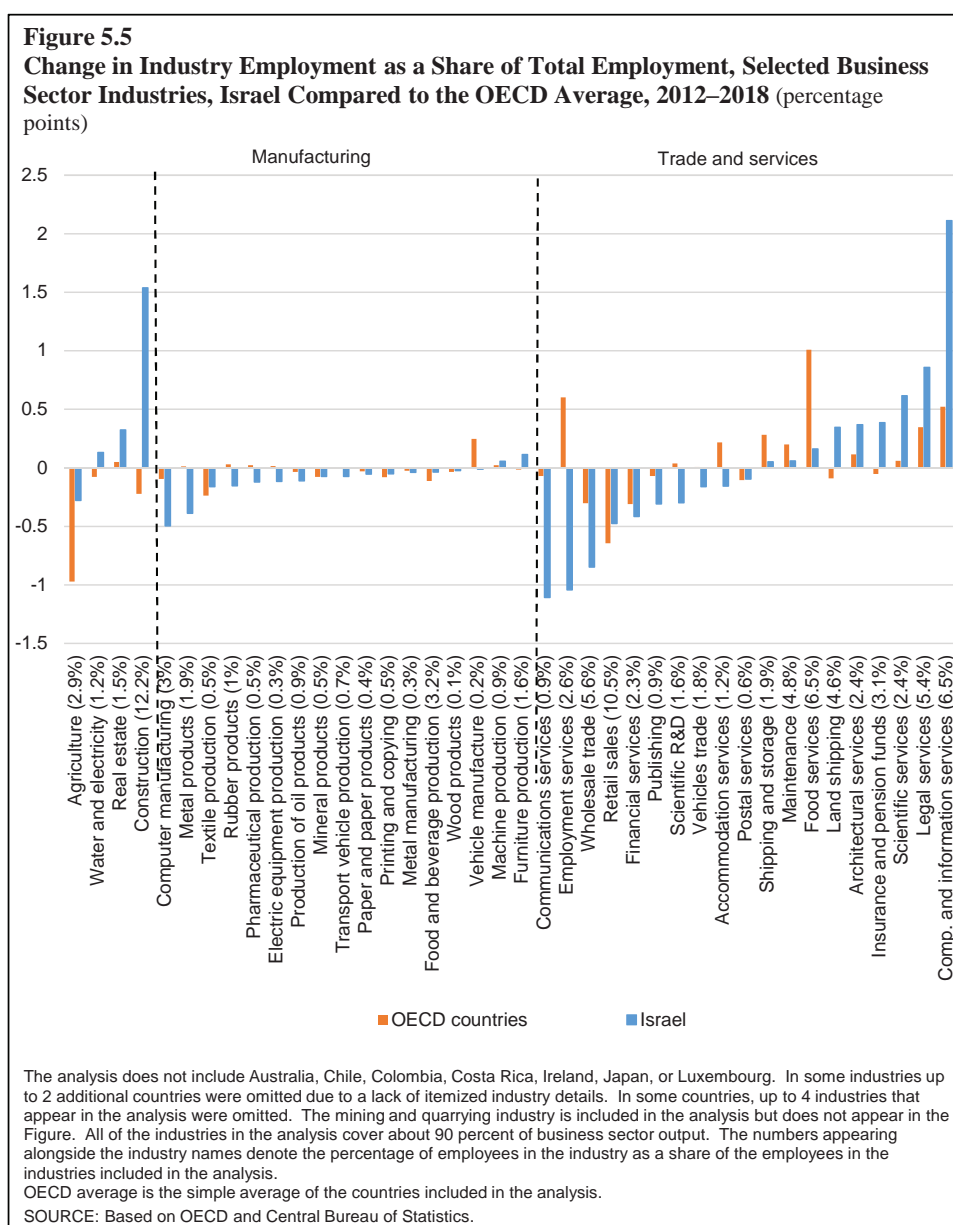
⁹ Regev and Brand (2015) examined the change in industry productivity and the change in the composition of workers between 1995 and 2012, and found that the nontradable industries with low productivity as well as a number of manufacturing industries that sell mainly to the domestic economy are responsible for most of the widening of the productivity gaps between Israel and the other OECD countries during the period. See E. Regev and G. Brand (2015), "Causes of the Widening of Productivity Gaps between Israel and the OECD: A Multiyear Industry-Level Comparison", State of the Nation Report: Society, Economy and Policy in Israel, 2015.

¹⁰ Various steps were taken to increase competition since the social protests of 2011. Among other things, the law to increase competition and reduce concentration in the banking market was enacted (implementing the 2015 recommendations of the Strum Committee); a reform in the wholesale market was implemented (covering the 2014 recommendations of the Gronau and Hayek Committee); and a number of government committees were established to deal, among other things, with examining the cost of food (Trajtenberg Committee and Kedmi Committee in 2011 and Lang Committee in 2015). In addition, the use of online technologies increased in various fields, such as the use of digital means to make card-not-present payments and bank transactions (Bank of Israel Annual Report for 2021, Chapter 1).

¹¹ The variance in the change in the distribution of workers in the services industries in Israel was 0.08 percentage points, compared with a lower variance in the other countries.

A comparison of the change in industry productivity in Israel between 2012 and 2018 to the OECD average indicates significant growth in relative labor productivity in most of the services industries, and mixed trends in the manufacturing and agriculture industries.

The main changes in the industry distribution of employment were in the services industries, while in most of the manufacturing and agriculture industries, the rate of employees declined moderately, like in the other countries.



Despite the changes in the distribution of employees between industries, the entire contribution of the structural change to increased economy-wide productivity was small, with most of the change in industry-wide productivity coming from growth in industry productivity.

Despite the changes in the distribution of workers among industries (Figure 5.5), the contribution of the structural change to growth of economy-wide productivity was small, with most of the change in economy-wide productivity relying on industry-level productivity growth. Economy-wide productivity growth between 2012 and 2018 was 10.7 percent, due to the positive contribution of increased industry productivity at an average rate of 12.6 percent, which was somewhat offset by the 1.4 percent negative contribution of the structural change. The reason for this negative

contribution is that the change in the distribution of workers between industries was not correlated with the change in industry productivity, as shown in Figure 5.6.¹²

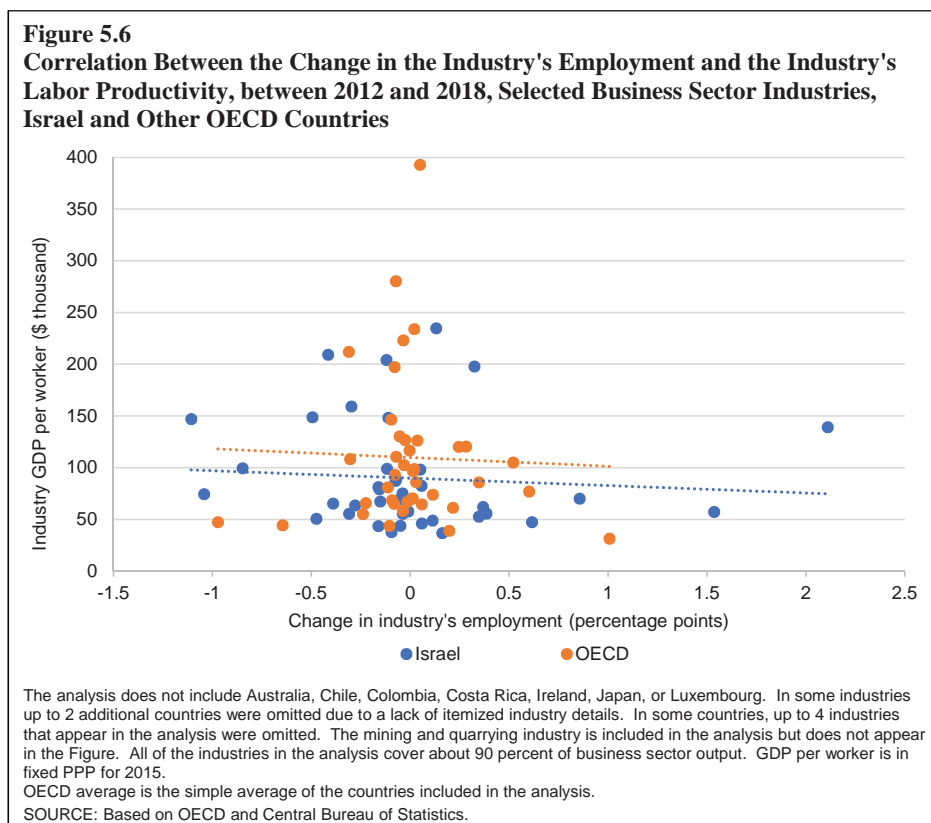


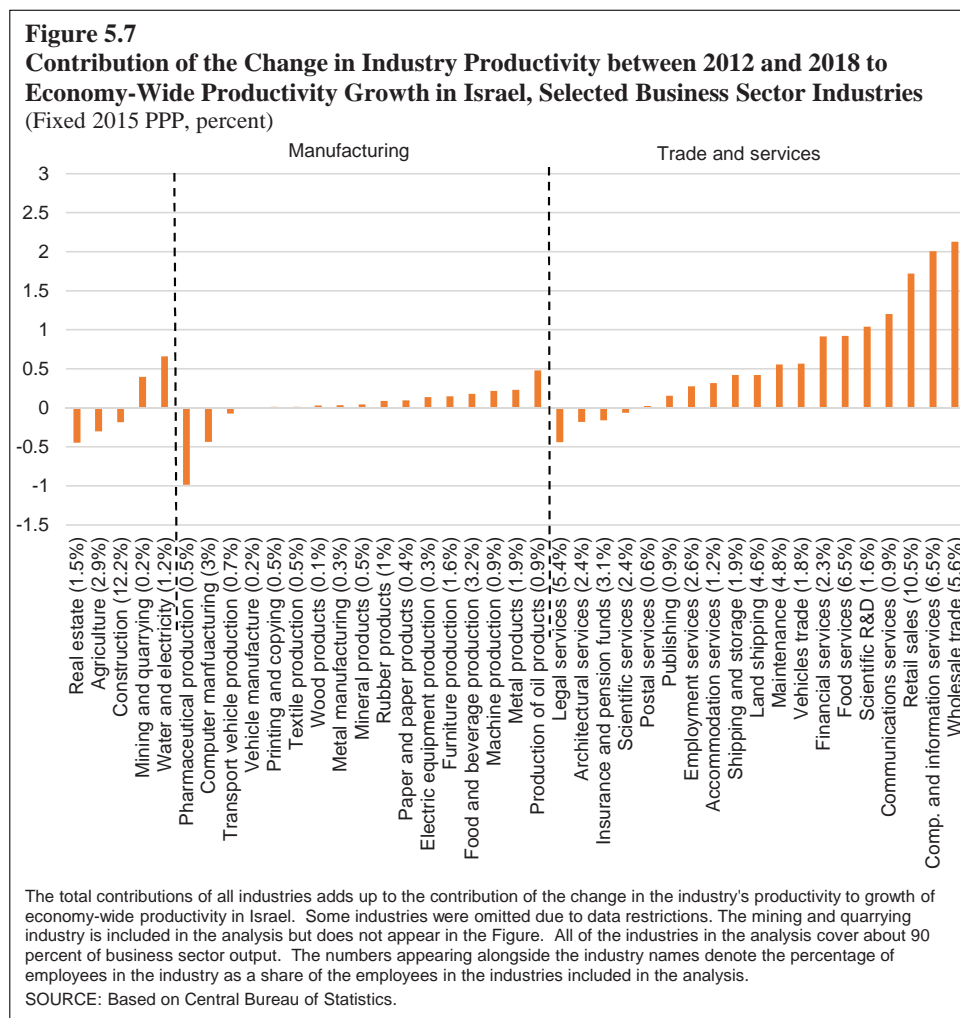
Figure 5.7 shows the contribution of the change in each industry's productivity to the growth of economy-wide labor productivity in Israel. The analysis concludes that the activity of the high-tech sector, including computer and information services and research and development, made a central contribution to the development of the services industry in Israel, from both an industry productivity perspective and in terms of employment growth. The global trend of intensifying demand for digital services and automation led to an increase in high-tech activity both in the Israeli economy and in the other advanced economies, but the Israeli economy succeeded in establishing its advantage in the field and in increasing it throughout the period.¹³ Beyond the increase in industry productivity and in the number of employees in the sector, the expansion of Israeli high-tech activity was reflected in an increase in the export of information, computer, and communication services as a share of total exports, which

The activity of the high-tech sector, including computer and information services and research and development, made a central contribution to the development of the services industry in Israel, from both an industry productivity perspective and in terms of employment growth.

¹² Adding the mining and quarrying industry, which has a very low employment volume and an exceptionally high output per worker in Israel, does not change the conclusion arising from Figure 5.6.

¹³ Chapter 2 of the Bank of Israel Annual Report for 2020, and Chapter 1 of the Bank of Israel Annual Report for 2021.

exceeded the other advanced economies, as well as an increase in investment in the information and communications industries as a share of total investment.¹⁴ A number of additional indices show the strength of the Israeli high-tech sector and its growth over the past decade. These include the rate of expenditure on research and development relative to GDP, and broad capital raising and issuances of Israeli technology companies on the stock exchange.¹⁵



¹⁴ The export of information, computer, and communication services increased from 13 percent of total services exports to 19 percent, compared with more moderate increases, from an average of 3 percent to an average of 4.5 percent, in other OECD countries. Investment in the information and communication industries increased from 5 percent of total investment to about 8.5 percent in Israel, compared with increases from an average of 5 percent to an average of 7 percent in the other countries.

¹⁵ According to the Innovation Authority's annual report on the state of high-tech (2022), Israel is ranked highly on the Global Innovation Index, and even rose in ranking during the past decade.

The increases in productivity and employment in the services industries were not only due to the activity of the high-tech sector. Other services industries also played a role. Economic theory provides a number of explanations for this. One of the main explanations involves streamlining and technological improvements, which led to increased industry productivity in some of the services industries and made some of the manpower in those industries redundant. As stated, the implementation of online technologies in industries such as retail trade, communications, and banking made it possible to reduce the number of employees necessary to provide those services, without reducing output. These processes, alongside reforms to encourage competition, made a positive contribution to the growth of industry productivity. This explanation is supported by the fact that these developments were accompanied by a marked increase in investment rates in those industries. Investment in all services and trade industries as a share of investment in all industries increased (by 12.8 percentage points), while the share of investment in manufacturing declined. This is compared with a more balanced upward trend in the other countries. In Israel, this was driven by a pronounced increase in the share of investments in the retail and wholesale trade and shipping industries and in the transport and storage industries.¹⁶

In contrast with the stated decline in the employment rates in some of the services industries, the rates increased in other services, such as legal, accounting, and consulting services; scientific and technical services; and architecture and engineering, even though productivity in those industries did not increase. One of the reasons for this is the increase in the standard of living and in disposable income, which enables the consumption of more services. Services consumption as a share of total private consumption did increase in the past decade (by about 2 percentage points), both in Israel and in the other countries, with most of the increase directed toward the consumption of leisure and culture services, financial services, and communication services. In Israel, the consumption of other services also increased—including legal, accounting, and consulting services—in line with the expansion of industry activity as described.¹⁷

The growth in demand in these industries may be supported by the increase in the labor force participation rate, in addition to the transition of workers to them from other services industries.¹⁸ The participation rates increased throughout the decade,

The increases in productivity in the services industries were also partly due to the retail trade, communications, and banking industries, thanks to streamlining that resulted from reforms to encourage competition, alongside improved service due to the implementation of online technologies.

The employment rates in a number of service industries, such as legal, accounting, and consulting services, scientific and technical services, and architecture and engineering services, increased, even though productivity in those industries did not increase. Employment in these industries grew in view of increasing domestic demand for service consumption, which was partly supported by an increase in the participation rate.

¹⁶ According to the OECD database, investment in the trade industry as a share of total investment increased by 4.4 percentage points, and investment in the transport and storage industry as a share of total investment increased by 4.1 percentage points.

¹⁷ According to the OECD database, the rate of consumption of these services as a share of total private consumption increased by about 2 percentage points during the period, both in Israel and in the OECD average, and by about 4 percentage points since the beginning of the century. The rate of expenditure on other services increased from 2 percent to about 3 percent in Israel, while the increase in the other countries was just slight—from 1.3 percent to 1.4 percent.

¹⁸ An analysis of the changes in the participation rate of various population groups appears in Chapter 7 of this Report.

particularly among women.¹⁹ The increase in women's labor force participation rates is a global trend, but its implications for the Israeli labor market were more significant than in other countries. Women's employment rate was always higher in the services industries, and this trend intensified in the past decade. The rate of women employment in the services industries in Israel increased from 89 percent to 92 percent, compared with a stable average rate of around 80 percent in the OECD countries.

3. CONCLUSION

In the past decade, labor productivity has increased in the Israeli economy, even relative to the OECD average. An industry-level examination shows that most of the growth in productivity comes from increases within the industries, particularly the services industries. The noticeable change in the structure of the industries did not contribute directly to the increase in average economy-wide productivity. The employment rate increased in the services industries, including in the high-tech sector, while it declined in some of the manufacturing industries. A long-term view shows that these trends are due to longer-term trends that have taken place in all advanced economies as part of the process of transitioning from production-driven economies to economies that increasingly tend to be based on services. In the Israeli economy, the change in the industry structure in the past decade was broader than in other countries, as was the contribution of increased productivity in the service industries to economy-wide productivity. An industry breakdown shows the high-tech sector's significant share in these developments, but the phenomenon is noticeable in a number of other services industries as well. Productivity grew in the trade, communications, and banking industries thanks to streamlining processes as a result of reforms to increase competition and improvement of service through the implementation of online technologies. In contrast, the growth of employment in other industries was not accompanied by changes in productivity, and took place in view of increasing domestic demand for service consumption, which was supported partly by an increase in the participation rates.

In order to support continued improvement of labor productivity in the economy, the government must help maximize the potential human capital of its citizens, accelerate the development of physical infrastructure that supports activity, continue to remove restrictions on imports and barriers to competition in the economy, advance structural changes in the financial system in order to increase the availability of capital to businesses, and streamline regulation and bureaucracy in doing business. In addition, it is important that government policy, particularly as part of the Capital Investment Encouragement Law, be balanced in its support of the various industries. Market failures must be dealt with, and the unique nature of some of the services

¹⁹ Over the past two decades, the participation rates of women in Israel increased from 53.7 percent to 60 percent, compared with a more moderate increase in the other countries (from 51.1 percent to 53 percent).

industries must be considered in order to continue encouraging investments and the implementation of productivity-raising technologies in those industries.²⁰

Initial signs indicate that the COVID-19 crisis intensified these productivity trends and the increased weight of the high-tech sector. (See Chapter 2 of this Report.) One reason for this is the increase in global demand for digital services and automation, which expanded due to the crisis and led to an increase in activity of the high-tech sector. Another reason involves the impact of the crisis on the consumer culture in favor of increased service consumption online. Supply chain disruptions may have also increased the relative price of certain goods, thereby contributing as well to increased service consumption. As stated, these developments are expected to continue and to increase both the supply of services in the economy and the demand for them.

APPENDIX A5.1

The data on the OECD countries were taken directly and without adjustment from the OECD STAN Database for Structural Analysis, 2020 Edition, ISIC rev.4, SNA08. The analysis does not include Australia, Chile, Colombia, Costa Rica, Ireland, Japan, or Luxembourg. In some industries, we omitted up to two other countries due to a lack of itemized industry detail. For some countries, up to four industries included in the analysis were omitted. The average labor productivity in the OECD did not include a country's industry in which productivity was more than four times higher than the industry average or below 0.25 percent of the average for the industry. In addition, a country's industry was excluded if its share of employment in that country was less than 0.05 percent. As a result of these restrictions, the industries included in the analysis include about 90 percent of business output.

The analysis did not include the public service industries, since these include the public sector where there is no direct measure of labor productivity. In addition, industries 34, 40, 48, 54, 57, 67, and 76, and industries R, S, T, U, and X were not included. Since a large part of the OECD data do not include most of the Israeli industries at a 2-digit level, the Israeli data are based on GDP/employment data from the National Accounts at the order level, and are segmented among subindustries at the 2-digit level according to the weight of the subindustries in the gross value added/job positions in the Economic Industry Survey and in the Manufacturing Survey. Price data at the two-digit level for Israel were weighted on the basis of the OECD database's order level data on Israel. A sensitivity test, using a similar analysis according to data on Israel and the other OECD countries included in the current price analysis, shows that the change in prices during the reviewed period does not significantly affect the findings. Furthermore, there were no large differences found when the prices were translated to current dollars using the exchange rate rather than PPP terms of overall GDP.

Initial signs indicate that the COVID-19 crisis intensified a number of trends: Increased global demand for digital services, increased service consumption online, and an increase in the prices of some commodities due to supply chain disruptions. These are expected to continue increasing both the supply of services and demand for them.

²⁰ For more detailed recommendations, see the Bank of Israel reports mentioned in footnote number 1.