Chapter 5

The Labor Market: Structural Processes

- The unemployment rate in Israel is low as a result of long term processes that have enabled the labor market to respond relatively quickly to changes in the economic environment and have acted to reduce structural unemployment.
- The increase in the population's education level has improved the matching of the qualifications of those looking for work with the requirements of vacant positions, while changes in the search process contributed to a decline in the frictional component of unemployment. As a result, the duration of the search has been shortened among both employers and the unemployed.
- The level of employment in export industries is more volatile than in domestic-market oriented industries, but the personal employment situation in export industries is more stable than in the rest of the business sector.
- The agglomeration of population and employment in the Tel Aviv metropolitan area represents an equilibrium that doesn't tend to change without government intervention. In the periphery there are fewer quality positions, which is one of the main obstacles to the population with higher education moving to these areas. In order to encourage the wider geographic distribution of the population, centers of attraction in the periphery must be created for companies and for employees as part of an overall solution.

In the past decade, there has been a trend of decline in the unemployment rate in Israel, with a corresponding increase in the labor force participation rate and in the employment rate. Unemployment declined to low levels despite the fact that for the past two years the economy's growth rate has been more moderate than in the past.[1] This is explained, apparently, by long-term processes that have occurred in the labor market and acted to reduce structural unemployment.[2] There has also been empirical evidence over the past few years of a decline in the frictional component[3] of unemployment, and this decline is reflected in the shortening of the duration of the search among both employers and the unemployed.

Due to the reforms over the past few decades, Israel's labor market has gained the ability to rapidly adjust itself to the changing economic environment.

While cyclical unemployment derives from the lack of demand for labor and tends to decline with economic recovery, structural unemployment derives from a structural lack in matching job vacancies to job seekers, and doesn't disappear even when demand for labor increases. The decline in structural unemployment derives from changes that affect the labor market's ability to respond to economic shocks, meaning the attributes of the labor force, the composition by industry, and the institutional structure of the labor market. The Israeli labor market's flexibility contributed to the decline in the unemployment rate, becoming a market that rapidly adjusts itself to the changing economic environment. This process started at the beginning of the 1990s, and most of the changes and reforms were intended to make it easier for employers to adjust the workforce to their changing needs, by simplifying, and reducing the costs, of the hiring and dismissal processes.[4] Some of the reforms negatively impacted employment conditions and employment security of employees, and it would be appropriate to invest resources in an active policy in the labor market and in expanding the rights of the unemployed.[5] One notable change was the managing of employment through companies specializing in providing manpower. This method provides employers with freedom of action and saves the costs inherent in managing human resources. Another prominent change took place with the development of the high technology industries—sectors that are exposed to increased international

[1] A review of developments in the labor market appears in Chapter 2 of this report.

[2] Structural unemployment is created when the qualifications of those looking for work are not well matched with the requirements of the vacant positions, or when the geographic distribution of demand for employees is not well matched with the distribution of those looking for work.

[3] Frictional unemployment is temporary unemployment that does not indicate an imbalance in the labor market, and may also exist in a situation of full employment. It derives from the heterogeneity of positions and of workers, meaning from the fact that the matching between them is not immediate and is not perfect. It is also acceptable to include the transition period between jobs within this definition.

[4] Employee protection laws make it harder to dismiss, and cause a weakening in the ratio between vacant positions and unemployment, a ratio that is outlined by the Beveridge curve. When contracting industries shed employees, the expanding industries hesitate to employ new workers due to the concern that it will be hard to dismiss them if necessary.

[5] This is the accepted way of thinking in the "flexicurity" approach that originated in Denmark. This approach has recently been expanded to include other European Union countries, and it combines flexibility and competition in the labor market and social security for workers. The method is based on tri-partite agreements between the government, employers and workers' unions, and gives employers more flexibility in hiring and dismissal. The government, for its part, provides the unemployed with benefits and adopts an active policy in the labor market.

competition and that employ educated workers—since employment through personal contracts then became routine. The new form of employment was accompanied by a decline in the unionization rate of employees (from about 65 percent of the economy in 1992 to about 24 percent in 2012)[6] and limited the power of the Histadrut (General Federation of Labor) in negotiations with employers.

A number of processes played a role in increasing the labor market's flexibility: The long growth period between 2004 and 2008, the increase in the level of education of the population, and the government's actions as part of the fiscal consolidation process. Some of these actions encouraged the integration into the labor force of population groups with relatively low participation levels (such as reducing income assurance payments for the working age population and child allowances, the operation of "welfare to work" programs, and in recent years, the Earned Income Tax Credit[7] and investment in support services such as subsidized child care), while other actions affected the job search process among the unemployed (reducing unemployment insurance). All of these processes contributed to a decline in unemployment.[8,9]

Even though the reforms in the labor market provided employers flexibility in the hiring and dismissal process, employers do not make much use of this flexibility in order to dismiss employees. One of the reasons for this is the increase in the share of industries where retaining employees is important—whether due to difficulty in recruiting appropriate workers or due to complex and expensive training processes. What makes it easier for employers to maintain their workforce during crisis periods is the relatively high level of flexibility in wages, since this enables them to reduce production costs and to maintain their profitability.[10] An estimate for the years 1995–2008 found that the elasticity of the share of wages in GDP (total wage payments) in

[6] A discussion of the unionization of employees in the Israeli economy appears in Recent Economic Developments 136, pp. 45–53.

[7] Formerly known as the "Negative Income Tax", and the "Income Grant".

[8] A study that estimated the Israeli Beveridge curve shows that structural rather than cyclical factors explain at least half of the decline in the unemployment rate between 2004 and 2011 (Yakhin, Y. and Presman, N. , "A Flow-Accounting Model of the Labor Market: An Application to Israel", Discussion Paper No. 2013.05, Bank of Israel Research Department.

[9] Israel is not the only country in which structural unemployment declined. In the years prior to the financial crisis, a decline in the unemployment rate was documented in the German economy, accompanied by movement of the Beveridge curve toward the origin, as a result of the implementation of a package of reforms in 2003–5 (Hartz reforms). The reforms reduced the cost of labor through subsidies and an easing of regulations (liberalization in the areas of dismissal laws, part-time and temporary labor, and manpower agencies), improved the quality of placement services (including placement through outsourcing to private companies), and cut the period of eligibility for benefits for individuals who remained unemployed for more than a year. (More information appears in Krebs, T. and Scheffel, M. (2013), "Macroeconomic Evaluation of Labor Market Reform in Germany", IMF Working Paper WP/13/42.) Germany is the only country in the eurozone in which the financial crisis had a minimal and short-term effect on the labor market, and the unemployment rate continued its declining trend, *inter alia*, because these reforms contributed to flexibility in the labor market, and due to an increase in the share of employees with higher education and the operation of short-term programs, financed by the government, to maintain jobs.

[10] The flexibility of wages does not necessarily need to be reflected in the contractual wage. It may also be reflected in a reduction in the number of actual work hours.

relation to the output gap in Israel is 0.86. This is a high level of elasticity compared to the OECD average—0.66—and compared to the range of elasticity values in the OECD countries—between 0.38 and 0.91.[11] Since the changes in total employment are relatively small, the high level of elasticity of total wage payments means a high level of flexibility in the wage per employee post.

This chapter elucidates the structural processes that have taken place in Israel's labor market through a discussion of three issues. The first concerns the volatility of employment (Section 1). Israel is a small and open economy, and its large volume of exports exposes it to the effects of the global economy. Global demand influences employment in the exporting industries, and employment in those industries is more volatile than employment in domestic-market oriented industries. The second issue (Section 2) deals with the job search process. Along with long-term processes, most of which acted through an effect on labor supply, there were changes in the job search process (expansion of the use of the Internet, including social networks, and shortening the candidate screening processes) which, together with the increase in the level of education of the population, contributed to an improvement in the matching function and a decline in frictional unemployment. This trend is reflected in the shortened duration of the processes of job searches and filling vacancies. The third issue (Section 3) indicates the differences between employment in the central region and employment in peripheral areas of the country. The decline in the unemployment rate, and weaker populations joining the ranks of the employed, were reflected in a narrowing of the gaps between unemployment rates in the center of the country and unemployment rates in the periphery. (A discussion of this issue appears in Chapter 5 of the Bank of Israel Annual Report for 2012.) Despite this, marked gaps remained between the regions in the quality of employment, which attracts the population to the center of the country and hinders the success of government attempts to more widely distribute the population and to support settling the periphery. In order to support these attempts, integrated handling is required—both in the supply of labor in the periphery and in the demand for it.

1. IS EMPLOYMENT IN THE EXPORT INDUSTRIES MORE VOLATILE THAN EMPLOYMENT IN DOMESTIC-MARKET ORIENTED INDUSTRIES?

Globalization has led to a marked increase in the volume of international trade and to economies' specialization in various industries based on their comparative advantages. As a result, there are changes in the industry composition of employment in the economy: Industries exposed to imports contract, eliminate jobs and dismiss employees, while export industries expand, create jobs and hire new employees. When export industries expand their share of employment, the labor market is exposed to

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[11] More information appears in "Israel's Cyclically Adjusted Deficit", Recent Economic Developments 132, September to December 2011, Bank of Israel, pp. 26–33.

external shocks and may increase employment volatility in the economy and put the employment stability of many workers at risk.

In contrast with nontradable industries (domestic services, commerce and the construction industry), activity in which is influenced mainly by domestic factors, activity in export industries is affected by both domestic and external factors—some of which are unforeseen, such as demand from abroad, changes in the terms of trade[12], and changes in the exchange rate. The multiplicity of factors affecting export industries increases the volatility of their output. In contrast, industries that produce basic consumer goods, most of which are intended for the domestic market, have less production volatility due to the smoothing effect of household consumption, which moderates the negative impact during a recession. This can be seen in Table 5.1, which presents an index of production volatility in selected manufacturing industries.[13]

Table 5.1
Index of production volatility[a] in selected manufacturing industries, 1996–2012

Economic industry (by 1993 industry classification)	Volatility index
Export industries:	
Industrial chemicals and fertilizers (Industries 240–241)	0.747
Pharmaceuticals manufacturing (Industry 245)	0.912
Electronics and electrical machine manufacturing (Industries 31–34)	0.333
Domestic-market oriented industries:	
Food products, beverages and tobacco (Industries 14–16)	0.029
Textile, clothing and leather products (Industries 17–19)	0.094

[a] The sum of squared deviations from the long-term trend.
SOURCE: Based on Central Bureau of Statistics.

Volatility in production should lead to volatility in employment, and therefore it would be expected that changes in the workforce in export industries would be more frequent and wide-ranging than the changes in the nontradable goods industries. The theory developed by Bhagwati and Dehejia (1994) and Bhagwati (1998) also forecasts this. According to this theory, a decline in shipping costs, an increase in the speed of communications, and the rapid development of technology created a global economy with very narrow profit margins. Moreover, exporters cannot rely on government assistance, because their competitors around the world are sensitive to the fact that countries enact institutional protection of manufacturers in their jurisdictions, and

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[12] The ratio between the development of dollar prices of exports and the dollar prices of imported raw materials.

[13] This index is calculated as the sum of squared errors of the Industrial Production Index from its long-term trend. The sum of the deviations themselves is zero.

they demand that principles of fair trade be honored.[14] As a result, an economy can gain or lose, almost instantly, a comparative advantage in any product. The researchers call the phenomenon "kaleidoscopic comparative advantage", and argue that it could create increased volatility in employment.

The analysis below compares the employment volatility in Israel's main export industries with other manufacturing and service industries in the business sector. Israel's exports are mostly concentrated in the high-technology industries[15,16]—their exports account for more than 40 percent of total goods and services exports, excluding diamonds. In view of this, and as high technology industries face difficulties in hiring the appropriate employees and are sometimes required to invest in their training, the importance of retaining employees increases. It would therefore be expected that some of the adjustment of inputs in these industries would be through changes in work hours and not in the number of employed persons. This is what happened in the 2008–09 crisis—many companies moved to a four-day work week, causing a negative impact on employee wages, with the aim of avoiding layoffs.

With that, an analysis of employment data in major export industries compared with domestic-market oriented industries indicates that throughout the examined years, employment in the export industries was more volatile, in the sense that it was characterized by greater deviations from the long term trend. The analysis is based on dividing business sector industries into four groups—major export industries in manufacturing, domestic-market oriented manufacturing industries, major export industries in business services, and domestic-market oriented business services, including commerce. The analysis is based on quarterly data on the number of employed persons and on the average number of weekly work hours per full-time employee. These data are calculated from Labor Force Surveys from 1996 to 2011.[17]

The analysis indicates that compared with domestic-market oriented industries, major export industries were characterized throughout the period by greater volatility in labor inputs, in accordance with the high level of volatility in production (see Table 5.1). In manufacturing, the difference in volatility derives mainly from volatility in the number of employees, while in services, both the number of employees and the average number of work hours per full-time employee are much more volatile than

Compared with domestic-market oriented industries, major export industries are characterized by greater volatility in labor inputs.

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[14] For instance, as part of the "Open Skies" agreement that Israel joined in 2013, the countries commit to avoid subsidizing their airlines. Restrictions were therefore imposed on subsidizing the security costs of Israeli companies.

[15] In manufacturing, the major export industries are (1) electronic components, (2) electronic communications equipment, (3) industrial equipment for control and supervision, and medical and scientific equipment, and (4) chemicals, including pharmaceuticals. In business services, the major export industries are computer services and research and development.

[16] The low technology and medium-low technology industries, which are typically labor-intensive, have a considerable share of exports in the economy, but since most of their output is directed toward domestic consumption, they are defined for the purpose of this analysis as domestic-market oriented industries.

[17] In order to neutralize long-term trends and isolate the cyclical component, we use the Hodrick-Prescott filter.

the parallel data in the domestic-market oriented industries (Figure 5.1). Apparently, export industries have the ability to adapt to changes in the economic environment and to respond to them rapidly, due to the flexibility of employment in those industries. It should be noted that some of the large companies in major export industries—such as Teva, Intel, Motorola, CheckPoint, and Amdocs—are multinational corporations. A study using the microeconomic data of companies in 11 European countries found that multinational corporations tend to adjust employment more rapidly than national firms (Barba Navaretti, et al. 2003). In services that are active primarily in the domestic market, there is minimal volatility in the number of employees, which is in line with the hypothesis that demand for nontradable services is more stable and less cyclical than demand for manufactured goods.

Figure 5.1
Volatility of Employment in Export Industries is Greater Than in Domestic-Market Oriented Industries[a], 1996-2011
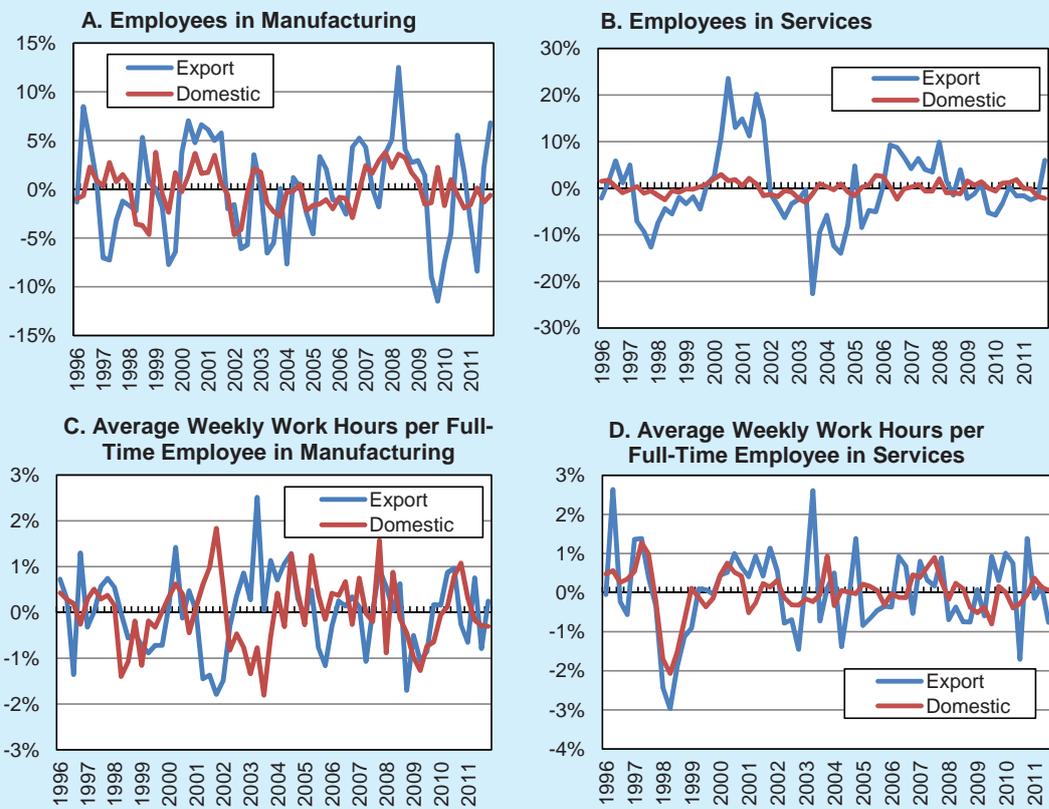
a Deviations from the long-term trend, in percent.
SOURCE: Based on Central Bureau of Statistics.

Despite the volatility
of employment in
export industries, the
employment status of
employees in those
industries is more
stable than that of
other employees in the
business sector.

Despite the volatility of employment in export industries, the employment status of employees in those industries[18] is more stable than that of other employees in the business sector.[19] First, the probability of remaining employed in the following quarter is higher in export industries than in domestic-market oriented industries (Figure 5.2a). Second, the probability of moving from employment to unemployment between two consecutive quarters is lower in the export industries than in the other industries, excluding the crisis in 2008–09 when most of the negative impact was actually in exports (Figure 5.2b). These findings do not necessarily show that employees remained in the same workplace, since the Labor Force Survey is conducted at low frequency (quarterly) and does not capture the cases where employees lose and find jobs within the same quarter.

Apparently the dynamism and the relatively rapid expansion of employment in the advanced industries enable people who lose their jobs to return to employment within a relatively short period. In addition, certain personal qualities of those employed in the export industries, particularly their high level of education, assist those individuals in searching for and finding work quickly, and in maintaining employment continuity.[20] The percentage of those with academic degrees among those employed in the major export industries is more than double that in the domestic-market oriented industries; the average number of years of study in export industries in manufacturing is two years higher than in the domestic-oriented manufacturing industries, and 2.6 years higher in services export industries than in domestic-market oriented services industries.

In order to ascertain that employment stability among those employed in export industries derives from those industries' unique characteristics, we neutralized fixed effects, of many other factors, that may have an impact on individuals' success in maintaining employment continuity. A logit regression was used to estimate the probability of remaining employed and of becoming unemployed as a function of gender, education level, marital status, age, area of residence, continent of birth, whether there are children aged 0–14 in the household, religion, immigration from the 1990s onwards, and of course, employment in one of the three groups of industries.[21] The results indicate that even after neutralizing fixed effects, and particularly employees' education, the probability of a person employed in an export industry

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[18] Since the number of observations in the analysis is relatively small, we combined the manufacturing and services export industries.

[19] For this purpose, we assess the probability of moving from employment to employment/ unemployment, based on a panel of Labor Force Surveys for the years 1996–2011. We exploit the fact that individuals appear in the survey in two consecutive quarters. Attachment to economic industry is assessed according to the first of those quarters. In order to neutralize the effects of marginal groups in the labor market, we focused the analysis on those aged 25–64.

[20] In general, the unemployment rate declines with an increase in the level of education, and the unemployment rate among those with higher education is lower than among those without higher education. The unemployment rate among those with 16 or more years of education was just 4.2 percent in 2013, while the unemployment rate among those with 11–12 years of education was 7.4 percent.

[21] In addition, the regressions include dummy variables for years and interactions of the years of the most recent crisis, 2008 and 2009, with employment in the export industries.

Figure 5.2
Probability of Moving from Employment to Employment/Unemployment Between Two Consecutive Quarters, by Industry of Employment in the First Quarter, ages 25-64, 1996-2011 (percent)

A. Employment to Employment

B. Employment to Unemployment

Export
Domestic manufacturing
Domestic services
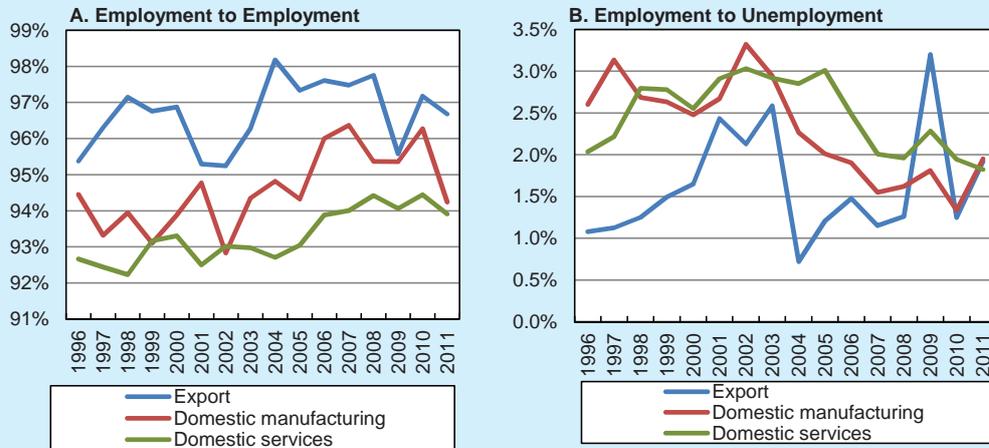
SOURCE: Based on Central Bureau of Statistics.

remaining employed in the following quarter is higher, and the probability that one will become unemployed is lower, than people employed in domestic-market oriented industries. The probability that a person employed in export industries will remain employed in the following quarter is 70 percent greater than the parallel data for a similar person employed in domestic-market oriented services, and 50 percent greater than a similar person employed in domestic-market oriented manufacturing. In contrast, the probability of becoming unemployed in manufacturing or in services oriented toward the domestic market is about 50 percent greater than the parallel data in the export industries.

Sources:

Bhagwati, J. (1998), "Trade and Wages: a Malign Relationship?", in S. Collins (ed.), *Imports, Exports, and the American Worker,* Washington, DC: Brookings Institution Press.

Bhagwati, J. and V. Dehejia (1994), "Free Trade and Wages of the Unskilled—is Marx Striking Again?", in Bhagwati, J. and M. Kosters (eds.), *Trade and Wages: Leveling Wages Down?*, Washington, DC: AEI Press.

Barba Navaretti, G., D. Checchi and A. Turrini (2003), "Adjusting Labor Demand: Multinational versus National Firms", *Journal of the European Economic Association*, 1 (2-3): 708-719.

2. EMPIRICAL EVIDENCE OF ACCELERATION IN SEARCH AND HIRING

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Since the 2008-09 crisis, there has been an acceleration in the vacancy cycle, which is reflected in a decline in frictional unemployment.
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Since the 2008–09 crisis, the job vacancy cycle in the economy has undergone a marked change, reflected in an increase in the vacancy yield[22] and a shortening of vacancy duration. In other words, there has been an acceleration of the vacancy cycle. The acceleration apparently reflects an improvement in the matching efficiency between workers and vacant positions, which is reflected in a decline in frictional unemployment. The analysis presented below provides empirical evidence of a shortening duration of search and an increase in the probability of being extricated from unemployment and reducing the share of long-term unemployed[23] out of all those unemployed.

When both job seekers and job vacancies exist simultaneously in the economy, it indicates a lack of matching the qualifications of those looking for work with the requirements of the vacant positions, or a lack of geographic compatibility between them. The relationship between the unemployment rate and the job vacancy rate is portrayed by the Beveridge curve, which is based on the matching function that defines the number of positions filled as a function of the number of unemployed persons and job vacancies in the economy. Movement along the rightward declining curve reflects the negative connection between unemployment and vacant positions as a result of cyclical factors: (during growth periods unemployment is low and there is a relative abundance of vacancies, while during recessions, the unemployment rate is high and employers are deterred from hiring new employees).

In contrast, a shift of the Beveridge curve reflects a situation in which the unemployment rate and the job vacancy rate increase or decline simultaneously as a result of structural changes in the economy. A study that estimated the Beveridge curve in Israel identified a number of episodes between 2004 and 2011 where the curve fluctuated, at the end of which it had shifted toward the origin (Figure 5.3).

Figure 5.3
The Beveridge Curve, 2004-13
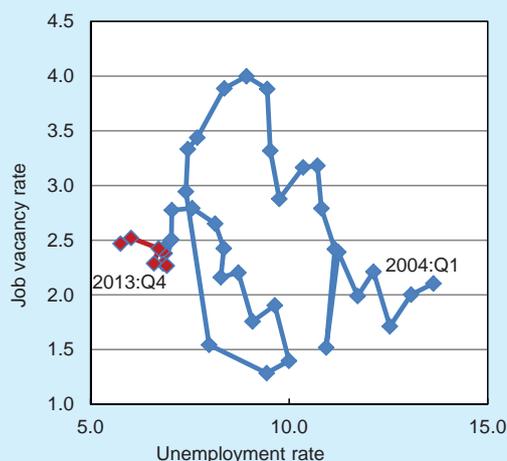
In red - data from 2012–13 based on the new Labor Force Survey sample.

SOURCE: Based on Central Bureau of Statistics and Ministry of the Economy.

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[22] The vacancy yield is calculated as the ratio between the number of positions filled in the current period and the number of vacant positions during the previous period, H_t/V_{t-1}

[23] Throughout the chapter, this term relates to unemployed persons who have been looking for work for more than 26 weeks.
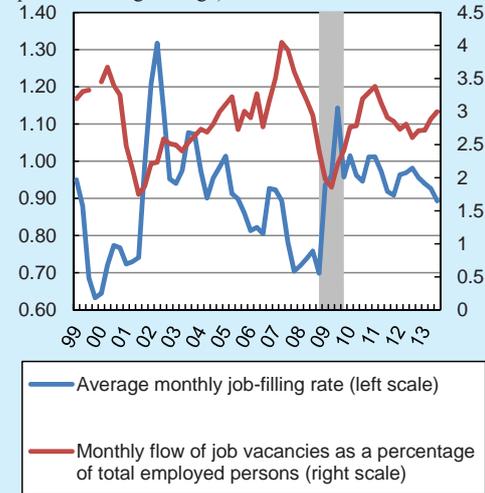
This shift reflects a simultaneous decline of the unemployment and job vacancy rates, and may derive from improved matching efficiency between open positions and those searching for work or from increased efficiency of the search process. These changes are reflected in an acceleration of the job vacancy cycle (meaning, as noted, an increase in the vacancy yield and a shortening of the duration of vacancy) and, as a result, a decline in the stock of vacant positions. From the standpoint of the unemployed, this change is reflected in an acceleration of moving from unemployment to employment and a decline in the share of the long-term unemployed.

An analysis of the changes on the side of demand for workers is

Figure 5.4
Average Monthly Job-filling Rate and Monthly Flow of Job Vacancies, 1999– 2013:Q3
(business sector excluding the agriculture and construction industries, seasonally adjusted, three-quarter moving average)

Average monthly job-filling rate (left scale)

Monthly flow of job vacancies as a percentage of total employed persons (right scale)

SOURCE: Based on Ministry of the Economy.

based on Employers Survey data from the Ministry of Economy. The analysis relates to two expansion periods[24] in the Israeli labor market—the first lasting from the second half of 2004 until the third quarter of 2008, and the second lasting from the beginning of 2010 until the third quarter of 2013[25]—and compares them to the crisis period (from the fourth quarter of 2008 until the end of 2009).

The examination shows that the average monthly vacancy yield increased between the two expansion periods by 13.3 percent (Table 5.2). Figure 5.4 shows the significant anticyclical dynamic of the hiring rate—it increases during recessions and declines during periods of expansion—but during the second expansion period, it stabilized at a higher level than during the first expansion period.[26] In contrast, the flow of vacant

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[24] The definition as a expansion period is based on the fact that a trend of decline was seen in the unemployment rate during the period.

[25] The end of the second expansion period was determined by the data available at the time of the analysis.

[26] As indicated by the figure, the hiring rate may be higher than 1. It should be noted that about half of the positions filled were not accompanied by a corresponding vacant position in the previous quarter, but since the analysis is based on a precise identification of the company and the position, the phenomenon does not derive from the replacement of companies in the survey. Since the survey is conducted at low frequency (quarterly), a considerable portion of the positions were created and filled during the same quarter, which makes those positions unobserved (due to time-aggregation bias). Likewise, it is possible that there are cases in which a company makes an immediate hire without advertising the vacant position (referred to as instantaneous hiring).

positions[27] is 8.1 percent lower in the second period of expansion than the flow during the previous expansion period. The mirror image of the increase in the hiring rate is the shortening of the duration of vacancy (the duration of vacancy ends as a result of

Table 5.2
Characteristics of the job vacancy cycle, business sector excluding the agriculture and construction industries[a]

	First economic expansion period 2004:Q3–2008:Q3	Crisis 2008:Q4–2009:Q4	Second economic expansion period 2010:Q1–2013:Q3	Rate of change between the two expansion periods
Monthly job-filling rate	0.84	1.01	0.96	13.3%
Flow of job vacancies as a percent of total employed persons	3.19	2.24	2.93	-8.1%
Job vacancy duration, in weeks	4.09	3.10	3.30	-19.2%

[a] The agriculture industry employs a small number of Israeli workers. The behavior of job vacancies in the construction industry is different than the behavior in the other industries: In recent years, job vacancies in the industry have had a particularly long duration, due to the high demand for construction professionals.

SOURCE: Based on the Ministry of the Economy's Employers Survey.

hiring or separation). The duration of vacancy was shortened by 19.2 percent between the two expansion periods.

It is important to assess whether the acceleration in hiring derives from only a cyclical change (in terms of the vacancy rate, the second expansion period was weaker than the first) or whether there was a structural change between the two expansion periods. The Employers Survey contains information on the length of time a position remained vacant, regarding both positions that remained vacant and those that were filled.[28] In order to combine data on the duration of the two types of positions, we model a uniform survival function in accordance with the distribution of the two types. In the first stage, we use a regression to assess how various factors affect the duration of the positions. The independent variables include those that reflect the effect of the business cycles and those that reflect fixed effects, such as the industry, the group of occupations to which the vacant position belongs, and the size of the company and the district in which it operates. In the second stage, the expected duration is calculated for each vacant position, based on the results of the regression. Figure 5.5 presents the results of the calculation—the probability that a vacant position will remain unfilled.

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[27] The flow of vacant positions is calculated as flow = $vacancies_t$ − $0.9vacancies_{t-1}$ + 0.9hires. We assume that 10 percent of the vacancies are cancelled before being filled.

[28] In the first case, the time was cut off at the point where the interview takes place (censored duration), while in the second case, it was cut off at the actual time required until the position was filled (completed duration).

The figure indicates that during the second expansion period, the probability that a vacant position would remain vacant was lower than the probability during the first period of expansion. This was the case for each period that the position had been in the market, starting from 5 weeks. In other words, after the crisis, the probability increased that the duration until a position was filled would be shortened.

To rule out the possibility that an acceleration in the job vacancy cycle during the second expansion period results from the weakening of growth experienced in 2012 and 2013, we assess the change that took place between the two expansion periods in the duration of vacancy

Figure 5.5
Probability of a Job Remaining Vacant, by Duration of the Vacancy in the Market, in Weeks

SOURCE: Based on Ministry of the Economy.

through a baseline hazards statistical test comparing the hiring rates. For this purpose, we leave the growth indices—the Composite State of the Economy Index and the companies' expectations of activity in the following quarter—at a fixed level[29], and obtain the probability of filling the position that is based solely on the duration that the position has been in the market. According to this test, the cyclically adjusted hiring rate in the business sector, excluding the agriculture and construction industries, increased by 5.6 percent, and increased markedly in a number of industries, mainly those employing educated workers, as well as in the construction industry. Table 5.3 presents the ratio between the probability of cyclically adjusted hiring during the two periods of expansion. Where the ratio is greater than 1, the probability of hiring during the second expansion period is higher than the probability during the previous expansion period.

The acceleration of the job vacancy cycle apparently reflects changes that have taken place in the process of searching for workers. Employers may influence the pace of hiring new workers in various ways, including changes in the methods of hiring and screening candidates, and improvements in salary offers or other employment terms. The use of these means may increase the number of candidates for a vacant position, reduce the duration of the screening process, and increase the readiness of the preferred candidate to accept the position. In recent years, the Internet has become a major hiring tool that is accessible, flexible and convenient, and it offers a range

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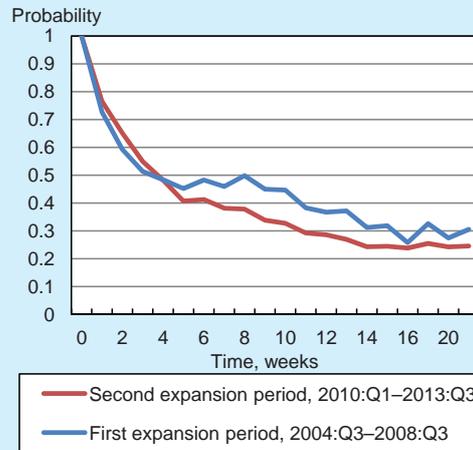
[29] For this purpose, we leave the Composite Index at a level of 0.3 percent (the average level over the long term) and company expectations of activity at the level of unchanged.

Table 5.3
Results of the baseline hazards ratio test, by industry

Economic industry (by 2011 industry classification)	Hazards ratio
High technology and medium-high technology manufacturing	1.26**
Low technology and medium-low technology manufacturing	0.92
Construction	1.13**
Commerce	1.04
Transport, storage and communication services	1.15**
Hospitality and food services	0.83
Information and communications	1.23**
Financial services and insurance	1.25**
Real estate and professional business services	0.89
Management and service support, arts, entertainment and leisure	0.91
Education, health, wellfare, and social work services in the business sector	1.02
Total business sector, excluding agriculture and construction	1.056**

** Statistically significant to a 5 percent level of significance.

SOURCE: Based on the Ministry of the Economy's Survey of Employers.

of tools for hiring workers while saving organizational resources. Most job listing websites enable those advertising to direct candidates directly to themselves, resulting in a shorter time period from the time candidates receive information about a vacant position until they submit their candidacy. In addition, there are companies that have developed on-line screening systems to conduct initial screening of candidates. Jobs are advertised not only on dedicated sites, but also on social networks, where those hiring can view a potential candidate's resume, experience, personal and business connections, level of knowledge and expressive capabilities. Moreover, the social networks enable employers to locate "passive candidates", meaning individuals who are not looking for work at that moment, but who will answer an attractive offer. The importance of this tool increases during boom periods, when employers have greater difficulty in finding good candidates.

To assess whether employers have changed their search methods, we use a rating of the demand for occupations, which was created by the Ministry of Economy based on a combination of four criteria: the number of vacancies, vacancies as a percentage of employed persons in that occupation, the starting salary, and the duration of the search for workers.[30] The demand for workers is rated on a scale of 1–10, and occupations with the highest demand belong to groupings 8 to 10. It turns out that the share of vacancies belonging to these groups out of total vacancies in the economy declined markedly between the two boom periods, accompanied by a decline in the

[30] The methodology and the results appear on the Ministry of Economy's website: www.economy.gov.il/NR/exeres.84E57160-2E37-4B20-A13F-668EC51831CB

share of vacancies characterized by longer durations. Similar to the industries, we also analyze the groups of demand for workers by way of a baseline hazards ratio test. We find a statistically significant increase in the groups of occupations with the highest demand (8 to 10) and in group 6. This result may indicate acceleration of the search for workers in these occupations. One index which reflects the acceleration of search is the average daily job-filling rate. This rate is calculated as the opposite of the expected duration of vacancy according to the survival regression[31] (Figure 5.6). This index stabilized in recent years at a higher level than during the previous boom period.

As for those searching for work, an assessment of Labor Force Survey data indicates that the share of long-term unemployed declined in the second half of last decade (Figures 5.7 and 5.8), and this finding can be connected to the fluctuation of the Beveridge curve toward the origin. US literature documents the opposite finding: a sharp increase in the share of long-term unemployed out of total unemployed and the constancy of a high unemployment rate despite a marked improvement in demand for workers in the economy. (The improvement is reflected in the fact that since 2009, there has been growth in the rate of job vacancies.) This is a phenomenon that

Figure 5.6
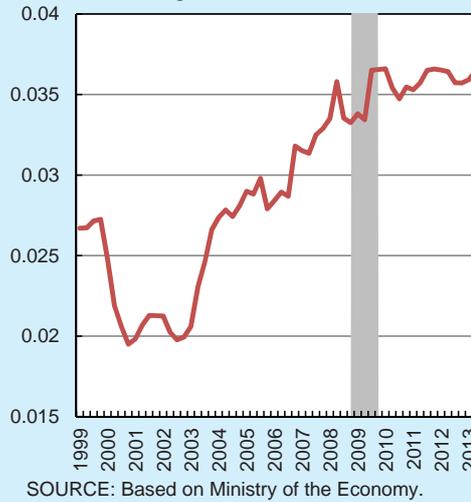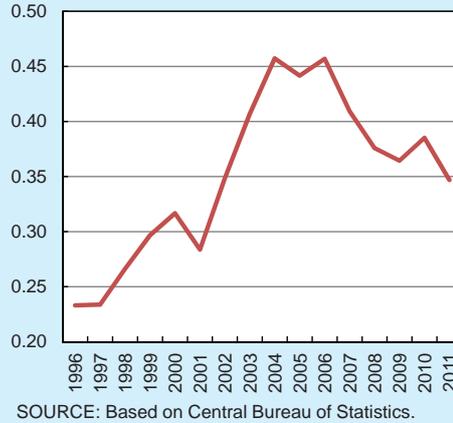**The Average Daily Job-filling Rate, Adjusted for the Business Cycle, 1999–2013:Q3**

SOURCE: Based on Ministry of the Economy.

Figure 5.7
The Unemployed for More than 26 Weeks as a Share of Total Unemployed, Ages 25–64, 1996–2011

SOURCE: Based on Central Bureau of Statistics.

[31] For instance, if an average of 10 days elapse until the position is filled, then on average, one-tenth of a position is filled each day.

Figure 5.8
Breakdown of the Unemployment Rate by Duration of Search for Work[a], Ages 25–64, 1996–2011

Unemployment rate

■ More than 26 weeks   ■ 15–26 weeks   ■ Less than 15 weeks
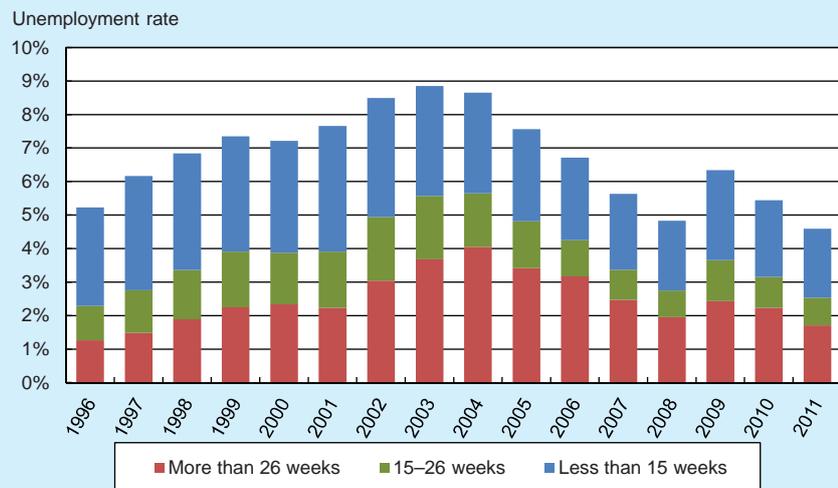
[a] According to the old Labor Force Survey sample.
SOURCE: Based on Central Bureau of Statistics.

is reflected in the Beveridge curve receding from the origin.[32,33] The main reason for the increase in the share of long-term unemployed is the increase in structural unemployment, but it is possible that the prolonged recession may also have an effect on this. Prolonged unemployment negatively impacts matching efficiency, since it erodes the human capital of the unemployed.

We calculate the chances of unemployed persons finding employment between two consecutive quarters using a panel of Labor Force Surveys for the years 1996–2011. Since the chances of exiting unemployment are influenced by the economic situation, we neutralize this dependency by calculating the probability of a transition from unemployment to employment through the estimation of an econometric model that assumes that the chances of being extricated from unemployment are dependent only on the accumulated time a person is unemployed.[34] Based on this model, we obtain

[32] See for example Hobijn, B. and Sahin, A. (2013) and Kroft K., et al. (2013).

[33] The Beveridge curve also receded from the origin following the crisis in the eurozone in general and in some of its member countries—mainly Spain, Portugal and France—and in the UK. The share of long-term unemployed increased there as well. One of the main factors for the matching inefficiency is the contraction of the construction industry as a result of the decline in real estate prices. The workers in this industry are characterized by qualifications that are specific to the industry and few years of education, which make it difficult to place them in other industries and leads to an increase in the dimensions of structural unemployment (Bonthius, et al. 2012; Hobijn, B. and Sahin, A. 2013).

[34] The model estimated is $A(d) = \exp(a_0 + a_1 \ln(d))$, where d is the duration of unemployment in weeks and $A(d)$ is the probability of transition from unemployment to employment, given d. The model is estimated for each year separately, and supports the negative time dependence hypothesis (i.e., a decline of the chances that a person will be extricated from unemployment as the duration of unemployment increases).

the probability that a newly unemployed person will find work, given the distribution of all unemployed persons according to the duration of search. Figure 5.9 indicates that since the middle of the last decade, the chances of unemployed persons finding a job between two consecutive quarters increased.

The simple search model describes the number of hirings as a function of the number of unemployed persons, the number of vacancies in the economy, and search technology. The model assumes that search technology is constant, and does not take into account all of the changes taking place over time, such as the expanded use of the Internet. The findings above indicate the changes that have taken place in the search process, and hint

Figure 5.9
Likelihood of a Newly Unemployed Person Finding Work Between Two Consecutive Quarters, Adjusted for the Business Cycle, 1996–2011 (depending only on the distribution of unemployed persons by duration of the job search)

SOURCE: Based on Central Bureau of Statistics.

that it is possible to improve the estimate of the matching function. We add a variable to the simple model that may reflect the changes that have taken place over time in the search technology—the average daily job-filling rate, adjusted for the business cycle (see Figure 5.6). The inclusion of this variable actually does improve the quality of the estimate by reducing the estimate error (measured by root mean squared error—RMSE). The improvement in the matching function reflects the changes that have taken place in the search process, and may contribute to estimating the Beveridge curve.
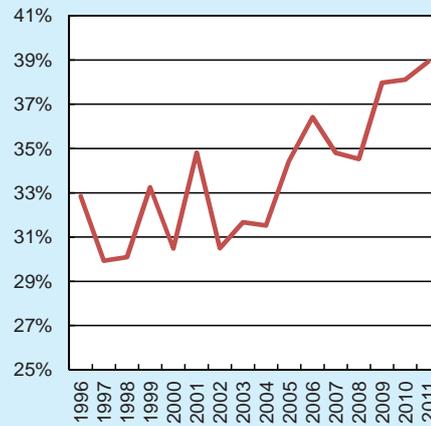
Sources:

Bonthuis, B., Jarvis, V. and Vanhala, J. (2012), "What's Going on Behind the Euro Area Beveridge Curve(s)?", European Central Bank, Worker Paper Series No. 1586.

Hobijn, B. and Sahin, A. (2013), "Beveridge Curve Shifts Across Countries Since the Great Recession", Federal Reserve Bank of San Francisco working paper.

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3. DOES THE SPATIAL STRUCTURE OF EMPLOYMENT SUPPORT WIDENING THE GEOGRAPHIC POPULATION DISTRIBUTION IN ISRAEL?

The main attractive force of the central region derives from the diversity of high-quality employment possibilities there. The periphery does not offer similar opportunities.

Internal migration data indicate that most of the population in the center of the country prefers to remain there, and the high housing prices reflect a high level of demand for residences there. In addition to the lifestyle offered by the central region of the country (proximity to cultural and leisure centers and to the sea), the main attractive force of this region derives from the diversity of high-quality employment possibilities that the periphery does not offer. The steady growth of the population in the central region causes a number of external effects: an overload on infrastructure, a reduction of open spaces, damage to nature, including beaches, increased congestion, and air pollution. In addition, the concentration of the economically established population in the center of the country expands the economic gaps between the center and the periphery. (A discussion on the development of spatial economic gaps appears in Chapter 8, in the box entitled, "Changes in inequality between and within districts in Israel".)

In order to deal with these problems, National Outline Plan (NOP) 35—the National Outline Plan approved by the government in 2005 that is intended to provide a planning response to construction and development needs until 2020—proposed principles for the wider geographic distribution of the population. The plan defined four metropolitan centers: Tel Aviv, Jerusalem, Haifa and Beersheva, between which there are non-urban areas (rural, preservation and coastal areas), and emphasized the importance of developing public transit to connect the periphery metropolitan areas with the center of the country.

In recent years, substantive steps have been taken to develop the periphery, in the spirit of NOP 35. A push to develop the Negev was provided by the government decision to move a number of IDF bases from the central region to the Negev, including the move of the Air Force transport base to Nevatim, the construction of the training city (the "city of training bases") near the Negev intersection, the construction of a teleprocessing base in Beersheva, near Ben-Gurion University of the Negev alongside the civilian high-tech industrial park currently being built, and the establishment of an Intelligence Corps base near Shoket intersection. This comprehensive project is supposed to be completed in 2018 (according to Government Decision number 3161), and should strengthen the settlement of the Negev through the development of employment.

In addition to this step, the Ministry of Economy initiated a new program with the aim of creating employment in the periphery. The program includes the establishment of 10 regional industrial zones in the north and the south, with an investment of at least NIS 3 billion. Each such industrial zone will serve a group of communities and will be established around a large anchor plant, while providing financial incentives to companies to move their manufacturing activities from the center of the country to the periphery. This is what was done at "NOAM", the joint industrial park shared by the cities of Netivot, Sderot and Ofakim and the Sdot Negev and Merhavim regional

councils, to which the Tara dairy relocated. Under a local initiative, "Idan Hanegev", a joint industrial park shared by the Bnei Shimon regional council, the Beduin city of Rahat, and the community of Lehavim, is currently under construction. One of its aims is to ease the employment distress among the Beduin population. The establishment of employment areas in the periphery may contribute to solving the problem of unemployment among Israeli Arabs, a population whose unemployment rate is high due to many impediments, such as a lack of mobility, social norms concerning the employment of women, and a relatively low level of education, as well as due to the possibility of discrimination in the labor market.

In recent years, the development of transportation connecting the center of the country with the periphery has been accelerated: the Cross-Israel Highway has been extended northward and southward, the construction of a rapid train line between Beersheva and Tel Aviv has been completed, a train station was recently inaugurated in Sderot, and Netivot and Ofakim will also be connected to the train route in the near future. Furthermore, the planning of the HaEmek (Valley) train line (a line from Haifa to Beit She'an) has begun, and it was decided to advance the construction of the track to Eilat.

The momentum of construction and the increase in home prices in the periphery indicate an increase in demand for housing services, but net internal migration to these areas is still negative. In order to encourage more established populations to move to the periphery, a range of employment must be offered in these areas, the quality of which is no lower than that offered in the center—in other words, employment that will meet the requirements and qualifications of the population that will choose to settle in the periphery. The concentration of employment in a few industries and/or the lack of quality positions are real barriers to the dispersal of the population.

Using Labor Force Survey data, differences between the employment diversity in the center of the country and the diversity in the periphery are assessed. For this purpose 5 regions are defined: the Haifa and North districts, the South district, the Jerusalem district, the Center district and the Tel Aviv district. The first two belong to the periphery and the last two belong to the center of the country.[35] In order to assess the diversity of employment, we focus on data on 44 groups of occupations and use, as accepted, the Herfindahl Index.[36] The smaller the index reading is, the greater the diversity. (In contrast, when all employment is concentrated in one occupation, the index equals 1.) This enables the ranking of the regions. When calculating the index at two points in time—1996 and 2011—we find that the employment diversity in the periphery regions is no less than that in the center (Figure 5.10).

When examining where there are high quality positions for those with higher education, it is found that despite the similarity in dispersal, there is a marked gap

[35] The Labor Force Survey enables the identification of sub-district of the workplace of those employed, thereby making it possible to obtain the geographic distribution of industries or occupations. In this analysis, we chose to separate the Center and Tel Aviv districts due to their relatively large size.

[36] The index is calculated as: $H = \Sigma_i x_i^2$, where x_i is the share of those employed in occupation i out of the total number of those employed in the region.

Figure 5.10
The Herfindahl Index of Employment Diversity, by Area, 2011 Compared to 1996
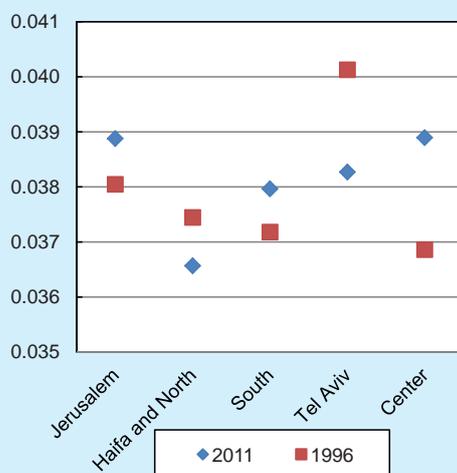
SOURCE: Based on Central Bureau of Statistics.

between the center and the periphery in the quality of the positions. For the purpose of the examination, 15 occupations were selected out of academics, associate professionals, technicians and managers occupational groups that are characterized by a relatively high salary, and we assessed the spatial distribution of those employed in these occupations. Since the regions are not identical in the volume of those employed, in order to judge the extent to which the distribution is equal, we must assess the share of those employed in a given occupation in each region relative to its share of total employment in the economy. When the region's share of those employed in a certain occupation is smaller than that occupation's share in total employment, it shows a lack of jobs that are appropriate for those with that occupation. As can be seen from Table 5.4, there are few occupations in the periphery for those with academic degrees in the computer sciences, architecture, law, finance, computer programming or administration. These positions are concentrated in the Center and Tel Aviv districts. The extent of their concentration in the Tel Aviv district is so high that more than half of the architects, attorneys, economists and accountants in Israel are employed in that district, while the Tel Aviv district accounts for just one-quarter of total employment in the economy. If we combine the shares of the Tel Aviv and Center districts (meaning the area of high residential demand), we see that their market segment for most of the quality positions exceeds two-thirds, while these two districts account for one-half of total employment in the economy. Since most people prefer to live a short distance from their place of work, those with the relevant professions are attracted to reside in the center of the country.

The theory explaining the agglomeration of employment in a few centers is called economic geography. At the beginning of the twentieth century, researchers noticed that most US industry was concentrated in small areas in the Northeast and in the eastern part of the Midwest, and they called this the "manufacturing belt". Manufacturing industries that were concentrated in the "belt" were characterized by the fact that they did not need to be in proximity to specific natural resources. The creation of industrial concentrations is explained by a combination of three factors: increasing returns to scale in the production function of individual companies, transport costs,

146

Table 5.4
Distribution of employees by selected occupations, by region, 2011

(percentage of total employees for the occupation)

	Jerusalem	Haifa and the North	Center	Tel Aviv	South
Systems analysts and academic professions in the computer sciences	7.3	7.7	38.4	42.2	4.4
Computer practical engineers, technicians and programmers	10.1	14.1	31.9	39.3	4.6
Electrical and electronics engineers	4.9	33.6	30.2	19.4	11.9
Mechanical engineers	1.3	32.2	38.1	9.6	18.7
Computer engineers	5.7	26.9	38.2	23.9	5.3
Physicians	13.2	26.3	19.3	24.6	16.5
Dentists	16.3	29.1	27.1	19.7	7.8
Lawyers	9.9	15.1	15.3	53.5	6.2
Economists	10.9	9.6	18.1	58.8	2.7
Psychologists	11.4	23.2	28.7	29.4	7.4
Accountants	10.8	18.8	14.2	52.2	4.0
Architects and urban planners	8.2	15.9	15.9	54.3	5.8
Company executives and general managers in the business sector	8.4	16.0	29.2	37.9	8.5
Executives in financial services and taxation	12.7	14.0	21.9	42.8	8.6
Advertising and marketing managers	7.1	15.2	32.8	38.8	6.1
Total employees	11.0	26.3	24.9	25.1	12.7

SOURCE: Based on Central Bureau of Statistics.

and demand. Assuming that there is increasing return to scale, a manufacturer will prefer to locate all manufacturing in one place, and in order to minimize the costs of shipping, will choose a location that has a high level of demand. As it is not profitable for a company to invest in building a plant in an area with a small population, most manufacturers choose to locate themselves in a place where local demand is high. Yet at the same time, it is beneficial for the population to settle in an area with plentiful employment. This creates a phenomenon called circular causation (Myrdal, 1957) or positive feedback (Arthur, 1990): Industrial production tends to be concentrated in proximity to a large market, and the market, for its part, grows precisely in a place where industrial production is concentrated. Eventually, the formation of cities is motivated by individual firms' increasing returns to scale (Krugman, 1993).

The concentration of manufacturers in one location is an example of the process of agglomeration. Apparently, the concentration of similar manufacturers in one

center should create competition between them and spur them to move away from the center. However, the economic force pushing for concentration is stronger. First, the concentration of similar companies in one location creates joint demand for workers with qualifications that are specific to the industry, which reduces the risk not only of a lack of manpower but also the risk of unemployment. Second, such concentration creates joint demand for nontradable intermediate inputs and supports their manufacture. And finally, information spillovers contribute to an improvement in the production function of companies in the cluster.

In certain industries, there is an advantage to the concentration of activity in one center. For instance, the city of Tel Aviv developed over the years as the financial center of Israel, similar to major cities in other countries. In contrast, the activities of the high technology industry can be decentralized, since there is the possibility of creating a number of centers for its development, in line with the dispersal of university research centers. Most high technology companies are currently concentrated mainly in the central region. The main market for these companies is abroad, but the relevant consideration for these companies is the availability of the appropriate labor force, most of which lives in the center of the country. The companies are therefore prevented from moving to the periphery due to a lack of skilled labor, and workers are prevented from moving to the periphery due to a lack of quality places of work. (Moving further from the center may cause significant commuting costs.) New companies also prefer to locate near more veteran companies and to exploit the advantages of an existing economic infrastructure.

In order to succeed in widening the geographic distribution of the population, the government must initiate and drive a process of agglomeration in the periphery by providing incentives—both to companies and to workers—to move there, while strengthening academic research.

Therefore, the government's success in widening the geographic distribution of the population depends on its ability to create attractive employment centers outside of the central area. For this purpose, it must initiate and drive a process of agglomeration in the periphery by providing incentives—both to companies and to workers—to move there, while strengthening academic research. Accumulation of a critical mass of companies and development centers in the periphery is likely to contribute to cooperation between them and to the availability of manpower. That is how successful high technology industrial areas in Yokneam and in Nazareth were established on the basis of research activity by the Technion. It also seems that the construction of the teleprocessing base and the civilian high-tech industrial park in Beersheva, close to Ben-Gurion University, is a step in the direction of this objective. An improvement in public services, the creation of quality jobs, and relatively inexpensive housing solutions will enable a high quality of living for the population of the periphery. The growth of an established population in the periphery will create demand for quality services and will raise the level of education. As to companies, the provision of financial incentives in the first stage will raise the competitiveness of the companies that will decide to locate in the periphery, and contribute to networking that will attract additional companies to the area.

Sources:

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