Economic Well-Being in Rural Communities: The Role of Agriculture

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Abstract

Throughout the developed world, the share of agriculture in total income of the rural population is declining. This is due to push and pull factors. On one hand, terms of trade of agriculture are falling and farmers are forced to seek additional income sources. On the other hand, population expansion in rural areas, including an important component of urban-to-rural migration, creates attractive opportunities for alternative income-generating activities. The question is whether agriculture is good or bad for rural well-being. Are communities with more agriculture composed of stronger farms that enhance economic well-being, or perhaps more agriculture means lack of alternatives, in which case the outcome is the opposite? The answer has important implications for agricultural and rural policy.

This paper attempts to answer this question in the context of Israeli Moshav semi-cooperative villages. These villages were established by farmers but have experienced a rising trend of exodus from farming in recent years and an inflow of non-farm population. We use village-level data derived from Censuses of Population and Censuses of Agriculture to study three complementary measures of well-being: income per-capita, housing spaciousness, and automobile ownership. We estimate a recursive system of simultaneous equations in which housing spaciousness and automobile ownership depend on income per-capita. The fraction of agriculture in total income in each village is the central explanatory variable. We also use explanatory variables representing demographic and economic characteristics of the villages, as well as geographic location and institutional affiliation.

The results show that agriculture has a significantly negative effect on income per-capita. Income per-capita is also affected positively by the fraction of the population in the labor force, by the fraction of self-employed, and by the fraction of the population holding academic degrees. It is affected negatively by the distance from Tel-Aviv (the economic center of the country). Housing spaciousness and automobile ownership are affected positively by income per-capita. Holding income per-capita constant, housing spaciousness and automobile ownership are affected positively by the importance of agriculture. Housing spaciousness is also affected positively by median age in the village and the dependency ration, and negatively by household size. Automobile ownership is affected positively by household size and negatively by the dependency ratio.

We conclude that rural communities that rely more heavily on agriculture are worse off in terms of income per-capita, but this adverse effect on well-being is partially offset by opposite results with respect to housing spaciousness and automobile ownership. The decline of agriculture is clearly not fully compensated by alternative sources of income. Provided that the global decline of agriculture will continue, the challenge of the authorities is to promote sufficiently attractive employment opportunities in rural areas that will smooth the occupational migration out of farming and prevent rural poverty.

Introduction

This paper investigates the impact of the importance of agriculture in rural communities in Israel on the well-being of the local population. As agriculture loses its importance as a source of income throughout the developed world, the rural population gradually shifts to alternative income sources (Freshwater, 2000). The question is whether the share of agriculture in the rural economy has a positive or negative impact on the standard of living. On one hand, it could be that communities with a relatively large share of agriculture are those with a comparative advantage in agriculture, so that farming is still profitable enough even at times of declining overall terms of trade in agriculture. On the other hand, perhaps the relatively large share of agriculture indicates lack of alternative income sources rather than lower incentives to engage in other income-generating activities. On top of these arguments, given the flow of urban families who join rural communities in order to improve the quality of life (Rothwell et al., 2002; Mitchell, 2004), the importance of agriculture could be conceived as a positive amenity by some families and as a negative amenity by other families.

In Israel, the deterioration of agricultural incomes in the last two decades has been perhaps more extreme than in other countries, as a result of a sharp decline in government support and protection (Kislev and Vaksin, 2003). Although there are specific regions in which agriculture is still prosperous, such as the Arava valley, our hypothesis is that on average, the population is worse off in localities that rely more heavily on agriculture. The main objective of this paper is to test this hypothesis.

We use data on rural semi-cooperative (Moshav) villages obtained from four sources. The two major sources are the 1983 and 1995 Censuses of Population in Israel, which provide welfare indicators and other properties of households and individuals. The population censuses were conducted at the household level, but the data we obtained are

the means for each village. The main welfare indicator is income per capita, but we also examine two alternative indicators, housing density (number of people per room) and the number of automobiles owned by the household. The two secondary data sources are the 1981 Census of Agriculture that was conducted at the household level and the 1995 file of the Annual Census of Agriculture that is conducted at the village level and provides information on the levels of agricultural activities.[1] We use this information to construct an index of the importance of agriculture in each village, which serves as an explanatory variable.

The results are somewhat mixed. While the importance of agriculture has a statistically significant negative effect on income per capita, its effects on the other welfare indicators are not significant. Still, there is no case in which we find a positive effect of agriculture on well-being. This confirms our initial hypothesis, but also indicates the need for further research.

In the next section we provide historical background on the evolution of the agricultural sector in Israel. After that we describe the data and present descriptive statistics, and then we move to the empirical results. The final section discuses the conclusions and suggests several avenues for future research.

Israeli Agriculture in Perspective

Agriculture was one of the most important foundations on which the state of Israel was established. Since the end of the 19th century, Jewish settlers in Israel saw agriculture as a channel through which the link between the Jewish people and their ancient homeland can be re-established. Cooperation has been the key to the success of settlement and agricultural production. The two dominating types of cooperative settlements have been the Kibbutz and the Moshav (Kislev, 1992). The Kibbutz was a commune in which each

member produced according to his ability and consumed according to his needs. The Moshav was a semi-cooperative village made of individual family farms, in which certain activities such as purchasing, marketing, and financing were handled jointly in order to exploit economies of scale in these activities (Haruvi and Kislev, 1984; Schwartz, 1999; Sofer, 2001). A third type of cooperative settlement, Moshav Shitufi, was a compromise between Kibbutz and Moshav: production was handled collectively while consumption was handled individually. Ideologically, all three types of cooperative settlements explicitly highlighted farming as a way of life and not only as a way of making a living.

Economically, agriculture constituted a major fraction of national income and exports in particular for many years. Socially, the cooperative agricultural sector provided a generation of political, cultural and military leaders. After Israel declared its independence and masses of immigrants started pouring in, food security became one of the top priorities of the government. Many Moshav villages were established in the early 1950s, populated by immigrants, mostly in remote areas. The new settlers were provided with infrastructure and professional guidance in order to allow them to make a living off agriculture. Agricultural research was also promoted and financed by the government, and the resulting technological progress was remarkable.

In the 1970s, terms of trade of agriculture were already worsening, but the prosperity of agriculture continued thanks to the opening of export markets for fruits, vegetables and flowers. However, the inevitable decline of farming, experienced by virtually all countries during the development process, was around the corner. The reliance on exports made farmers more vulnerable to world price fluctuations and macroeconomic conditions. The unstable economic environment brought about by the high inflation in the late 1970s and early 1980s made farm income even more uncertain. The large debt due to the capital investments could not be serviced adequately (Kislev, 1993). The development

of non-agricultural production and service industries provided an alternative source of income, especially for the high-ability farmers. Out-migration from agriculture accelerated through two complementary channels. The first channel was by farmers selling their farms to urban families seeking rural-style residence (Kimhi and Bollman, 1999). The second channel was by continuing farmers seeking to supplement their income by engaging in non-agricultural activities (Sofer, 2001; Kimhi, 2000). These included on-farm small businesses as well as off-farm businesses and jobs, located in part in the surrounding rural area and in part in nearby urban centers.[2]

The farm debt crisis that followed the economy-wide 1985 stabilization plan was a major accelerator of this process. Many farms became practically delinquent due to the high real interest rates and could not serve as a source of income anymore. Many cooperatives collapsed, leaving their members without the safety net and support system to which they were used for decades (Kislev, Lerman and Zusman, 1991; Schwartz, 1999). Farmers were increasingly shifting to alternative income-generating activities, and while some of the more productive farms were able to acquire more farm resources and expand production, increasing fractions of land and other farm inputs were left unused.[3]

In the early 1990s, another structural change took place. With the mass migration of people from the former Soviet Union and the resulting shortage of housing, the government allowed farm communities to convert part of their agricultural land to non-agricultural uses, including both industrial parks and residential neighborhoods. This has also been viewed as a way to help farm families overcome the debt crisis. This policy provided farmers with more opportunities to develop non-agricultural businesses, and in addition allowed the communities to expand with the addition of many non-farm families that in some cases outnumbered the farm families. Both outcomes contributed to the

accelerated decline in the importance of agriculture as a source of income in rural Israel.[4] Today, in most Moshav villages only a handful of families are living off agriculture.

Data and Descriptive Statistics

The major source of data for this research is the Census of Population in Israel. We do not have observations on individuals or households, we only have village means of household and individual characteristics. The main welfare indicator we use as a dependent variable is income per capita. For 1995, we have both labor income and total income (including transfers), but we chose to work with labor income because there are many more missing values in total income.[5] For 1983 we only have wage labor income. We recognize that income is not the only possible measure of welfare. Other indicators of material well-being may be informative as well. Our data set includes two such indicators, housing density (average number of people per room) and the number of automobiles owned by the household. Housing density is reported by means of two variables for each village in the sample: "low density" is the fraction of households with less than one person per room on average, and "intermediate density" is the fraction of households with 1-2 persons per room, on average. We use low density as an indicator of material well-being. The number of automobiles owned by households is also reported by means of two variables: "one car or more", which is the fraction of households that own at least one car, and "two cars or more", the fraction of households that own more than one car. Here we choose two cars or more as an indicator of material well-being. While these choices are indeed arbitrary, we verified that their effect on the results is not qualitatively important.[6]

We focus on Moshav villages in this paper, because our secondary sources of data, which will be explained below, provide reliable information only on these communities.

Moshav villages were home for about a third of the rural population in Israel in 1983, and slightly less than that in 1995 (see figure 1 in Kimhi, 2004).

Table 1 compares the three measures of economic well-being in the two census years. We observe a sharp decline in income but an improvement in housing density and car ownership.[7] Table 2 presents the bivariate correlation coefficients of the three measures of well-being. We find that all the correlation coefficients are positive. The correlations of income per capita with housing density and car ownership are larger in 1995 than in 1983, while the correlation between housing density and car ownership declines between 1983 and 1995 and becomes insignificant.

The primary explanatory variable that serves the purpose of this paper is a measure of the importance of agriculture in each village. For this we use data from secondary sources. For 1983 we use data from the 1981 Census of Agriculture, which is conducted at the household level, and for 1995 we use the Annual Census of Agriculture, which is conducted at the locality level. Both data sets provide information on the levels of agricultural activities. This information was found reliable only for Moshav villages, and this is why we deal with these communities only in this paper. From this information we construct the value added (value of production minus purchased inputs) of the agricultural activities in each locality, by multiplying the size of each branch by a coefficient of value added per unit that was provided by the Central Bureau of Statistics, and summing up. The 1981 values are converted to 1983 prices by using an implicit price index of the value added in agriculture.

In table 3 we compare several measures of agricultural intensiveness. The first measure, denoted "value added per worker", is value added divided by the size of the labor force. The second measure is the division of value added by the total number of people older than 14 years of age that belong to households with agricultural activities. The fact

that this is lower than value added per worker is explained by the fact that not all the population in that age group is in the labor force. The fact that not all households are considered agricultural works in the opposite direction. We observe a considerable increase in the intensiveness of agriculture, but this is an overestimate because the value added figures that were used to calculate the price index in order to convert the 1981 value added to 1995 prices included the cost of hired workers, and the share of hired labor in total farm costs increased over the years.

For our measure of the importance of agriculture, we divide value added by the total income of all households in each locality, and obtain an index which should theoretically be between zero and one. As figure 1 reveals, there are a number of Moshav villages in which the "agricultural importance" index is above one. This is due first to the fact that value added is not identical to income by definition, and second to the fact that we use two very different sources of data. Still, this is the best available indicator of the importance of agriculture. Note that matching the 1981 value added data with the 1983 population census data required identification of the villages, and we were able to do that for only 120 of the 406 Moshav villages.

Other explanatory variables include demographic, economic, geographic and institutional characteristics of the localities. Demographic characteristics include village population, [8] mean household size, median age of the population, and dependency ratio (one minus the fraction of people from 20 to 64 years of age). We also include the fraction of people from 26 to 50 years of age with 9-12 years of schooling, with more than 12 years of schooling, and with an academic degree. [9] Economic characteristics include the labor force participation rate, the fraction of people employed in prestigious (academic and managerial) occupations, and the fraction of households headed by a hired employee. Geographic characteristics are represented by a set of regional dummies, according to the

regions defined by the Ministry of Agriculture (figure 2). Since these regions are defined by both agricultural and geographical properties, we also include the distance from Tel Aviv as an explanatory variable. This gives us a partial control for geographic location within regions. [10] Institutional characteristics include year of establishment and a set of dummies for affiliations in settlement movements.[11]

The means of the explanatory variables are reported in table 4. In terms of population, the Moshav villages increased in size between 1983 and 1995. This was accompanied by a decrease in household size, an increase in the median age and a decrease in the dependency ratio. The increase in population is likely to come through two channels. First, the rise in housing prices has induced more farmers' children to come to live next to their parents even if they have no interest in farming, up to the full capacity of two households per farm (Kimhi and Nachlieli, 2001). This also explains the decrease in household size and the dependency ratio, because these new households are headed by relatively young people. The second channel is through the new residential neighborhoods that were built in some of the Moshav villages. While it is not clear whether income per capita would go up or down due to the expansion, the importance of agriculture is very likely to decline.

Education has also increased in Moshav villages, and this is due to the new generation of residents. The increase in labor force participation, the fraction of prestigious jobs and the fraction of hired employees could be explained by the influx of non-farming families and also by the decline in the importance of agriculture.

The regional distribution of the Moshav population indicates that most of the population expansion was concentrated in the center of the country, while the population in the far north actually declined. However, the distance to Tel Aviv increased slightly on average, indicating that within regions, population shifted to more remote villages. We

observe a few new villages established between 1983 and 1995, and this explains the slight changes in the institutional variables.

Results

Table 5 provides bivariate correlation coefficients between the dependent variables and the explanatory variables. We first note that economic well-being is significantly correlated with most of the explanatory variables, and almost all of the correlations are consistent in sign across the three measures of well-being. In particular, the importance of agriculture, village population, median age, higher education, academic degrees, labor force participation and the fraction of prestigious jobs are all positively correlated with well-being. On the other hand, household size, the dependency ratio, the distance to Tel-Aviv and year of establishment are negatively correlated with well-being. High school education and the fraction of hired employees have mixed correlations but the trend is negative.

Tables 6-8 include the regression results for income per-capita, housing density and car ownership, respectively. Four sets of results are provided. The first two are separate regressions using 1983 and 1995 data, respectively. The third is a pooled regression with data from both years but without tracking the identity of each village. The last regression is a panel regression, using the matched observations from the two census years and allowing for village-specific fixed effects. Although the four different regressions produce quite different parameter estimates, there are some clear trends which we discuss below.

The importance of agriculture has a statistically significant negative effect on income per capita in Moshav villages. It has no significant effect on housing density, and has a significant effect on automobile ownership in the panel regression only. Village

population has a negative effect on housing density in 1995 and a positive effect on car ownership. Household size has a negative effect on income per capita and car ownership and a positive effect on housing density. Median age and the dependency ratio have a positive and a negative effect, resectively, on housing density. Higher education has a positive effect on car ownership, and the fraction of academic degrees has a positive effect on all three indicators of well-being. Labor force participation has a positive effect on car ownership, while the fraction of prestigious jobs has a positive effect on income per capita. The fraction of hired employees has a positive effect on all three indicators of well-being. There are few significant differences across regions.

Car ownership is higher in villages located in the Golan and Eastern or Western Galilee, while housing density is better in villages located in Yizre'el Valley and Lower Galilee or in the East Valleys and Arava, compared to those located in the center. Distance to Tel Aviv has a positive effect on income per capita. Year of establishment has negative effects on housing density and on car ownership, meaning that villages that were established earlier are doing better in terms of these two indicators of well-being. The coefficients of the 1995 dummy imply a statistically significant deterioration of income per capita and improvement in housing density between 1983 and 1995, holding everything else constant. The coefficients of the settlement movement dummies are not shown in the table, because few of them turned out statistically significant.

Discussion

Our conclusions regarding the effect of the importance of agriculture on economic well-being in rural Israel are therefore mixed. To the extent that income per capita is a satisfactory measure of rural well-being, households in Moshav villages with higher

dependence of agriculture are worse off. They are not worse off, though, in terms of housing density, and the results with regard to automobile ownership are inconclusive.

There is a possible interpretation of these results. While income is determined to a large extent by market forces, housing density and automobile ownership are household decisions. In particular, they are determined by income. Hence, the regressions we estimate are in fact reduced-form equations. One could say that housing density and automobile ownership are not affected directly by the importance of agriculture despite the fact that income per capita is adversely affected by the importance of agriculture. This implies that holding income per capita constant, the importance of agriculture may have a positive effect on the other measures of economic well-being.

The conclusion is, then, that while income per capita is lower in villages with more important agricultural production, households in these villages are compensated by enjoying a better housing density and more automobiles. In the case of housing, this may be due to the lower taxes levied on farm households who build or enlarge their residence. In the case of automobiles, this may be due to the use of automobiles in farm production, meaning that their purchase and maintenance are also tax deductible. Hence, the tax policy serves an important purpose of compensating farm households for the utility loss brought about by the decline of agriculture as a decent source of income.

It should be noted that measurement errors could be responsible for the negative effect of the importance of agriculture on income per capita. This is because aggregate village income appears in the numerator of the dependent variable and in the denominator of the explanatory variable. In this case a measurement error could create an artificial negative correlation between the two variables. This could be dealt with by finding suitable instruments for the importance of agriculture. For example, the 1983 importance

of agriculture could serve as an instrument in the 1995 regression. This task is left for future research.

Another route that is worth exploring in future research is the effect of local labor markets. In addition to the regional dummies and the distance to Tel Aviv, it should be possible to construct measures of the economic activity in the immediate surroundings of the villages, and use these as additional explanatory variables.

Notes

[1] The 1995 household-level Survey of Agriculture covered only 10% of farm households and hence was not satisfactory for our purposes.

[2] One should bear in mind that the concept of rural in a small country such as Israel is relative. Most rural residents live within a couple of hours drive from a major urban center.

[3] Legally farmers were not allowed to trade land and water quotas. This regulation was more or less self-enforced by the cooperatives, but after their collapse, and given the financial hardships of farmers, it became common to lease land and water, mostly on a short-term basis.

[4] Another outcome of the housing shortage was a boom in real estate prices. This allowed and still allows farmers in the central part of the country to sell off their farm to wealthy urban families who seek a rural residence and do not have any interest in farming.

[5] To make sure we don't miss anything important, we repeated the empirical analysis with total income. The results were qualitatively similar.

[6] The census was administered using two different questionnaires. The "short" questionnaire, which included basic demographic and household characteristics, was filled out by all households. The "long" questionnaire, which included more detailed work and income questions, was filled out by 20% of the households, chosen randomly. The housing density and car ownership variables are from the short questionnaire, while income is from the long questionnaire. We inflated the income variable by the inverse of the fraction of workers who reported their income, assuming implicitly that those who did not report their income are a random sample of workers.

[7] We expected a fall in income but not that sharp. We are in the process of rechecking the income calculations.

[8] Smailes, Argent and Griffin (2002) have shown that rural population density affected several socio-economic outcomes in Australia.

[9] McGranahan and Kassel (1997) showed that education is closely associated with rural growth. However, Artz (2003) claimed that education can affect rural well-being positively through the accumulation of human capital and negatively due to selective out-migration.

[10] Ehrensaft and Beeman (1992) showed that distance from a metropolitan center accounts for much of the differences between rural communities. Bollman (1999) found that in Canada, communities influenced by metropolitan centers benefited relative to other communities during the 1980s

[11] Historically, the settlement movements were ideologically differentiated, and this may have had long-lasting consequences for well-being.

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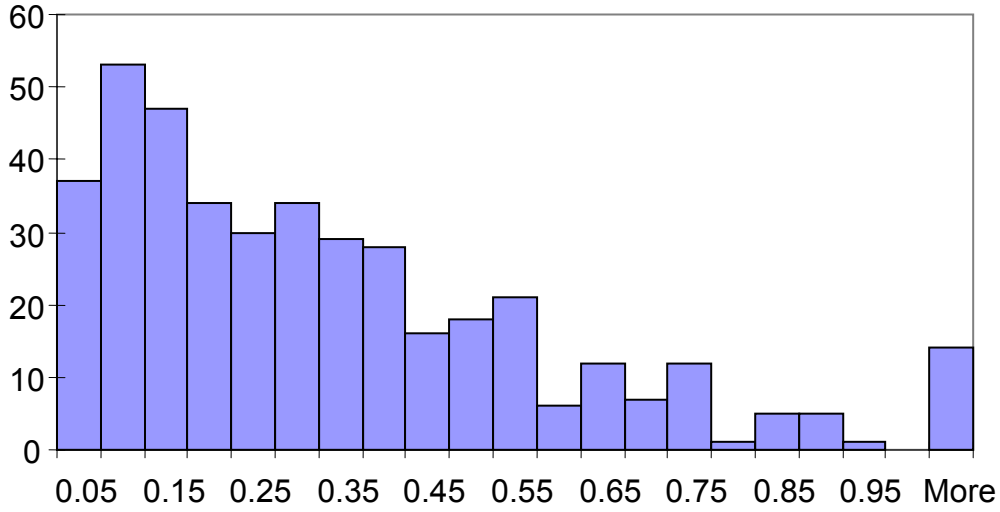

Figure 1. Histogram of the "Importance of Agriculture" Index, 1995

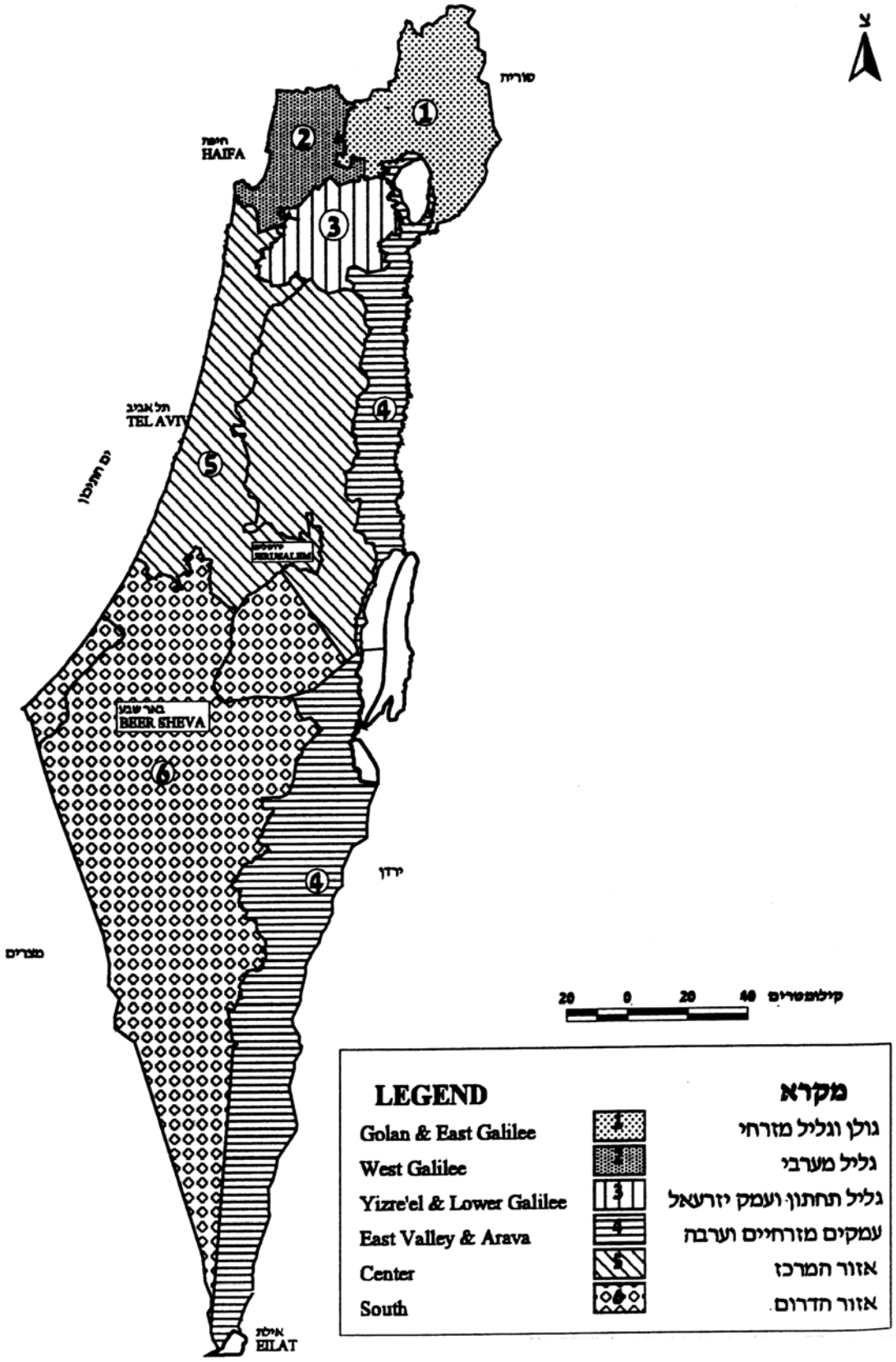

Figure 2. Geographical Regions

Table 1. Measures of Economic Well-Being

	1983	1995
Income per capita (1995 NIS per month)	3,108	1,692
Housing density		
2+ people per room (high density)	0.146	0.067
1-2 people per room (intermediate density)	0.361	0.449
0-1 people per room (low density)	0.493	0.484
Car ownership		
No cars	0.377	0.260
One car per household	0.519	0.478
More than one car per household	0.104	0.262

Table 2. Correlations of well-Being Measures

	1983	1995
Income and Housing Density	0.123**	0.269**
Income and Car Ownership	0.164**	0.578**
Housing Density and Car Ownership	0.402**	0.335

** Correlation coefficient significant at 1%

Table 3. Measures of Agricultural Intensiveness

	1981	1995
Value Added per Worker	11.103	46.559
Value added per Person in Agricultural Households	6.170	35.307

Units: NIS 1,000, 1995 prices.
Source: Value added is taken from *Agricultural Survey 1995*, Central Bureau of Statistics Publication No. 1081, and *Agriculture and Rural Census 1981: The Village in Israel*, Central Bureau of Statistics, 1985; 1995 labor force is taken from the 1996 Statistical Abstract of Israel, tables 12.2 and 12.7; 1981 labor force is taken from the 1982 Statistical Abstract of Israel.

Table 4. Means of Explanatory Variables

		Moshav	
Variable	Units	1983	1995
Demographic variables			
Population	People	419.41	488.65
Household size	People	4.05	3.46
Median age	Years	25.20	27.79
Dependency ratio	Ratio	0.99	0.87
High school	Percent	47.48	52.61
Higher education	Percent	28.56	38.74
Academic degree	Percent	9.68	17.49
Labor participation	Percent	63.36	68.96
Prestigious job	Percent	8.52	13.50
Hired employees	Percent	51.91	61.63
Geographic variables			
Golan & East Galilee	Percent	7.86	3.44
West Galilee	Percent	5.68	4.97
Yizre'el & Lower Galilee	Percent	7.07	7.07
East Valleys & Arava	Percent	4.03	4.81
Center	Percent	51.45	56.44
South	Percent	23.91	23.27
Distance to TLV	km	54.41	55.27
Institutional variables			
Year of establishment	Year	1948	1949
Tnu'at Hamoshavim	Percent	62.34	64.21
Hapo'el Hamizrachi	Percent	16.15	14.40
Ha'ichud Hachakla'i	Percent	10.98	11.11
Other	Percent	10.53	10.28
Number of localities	number	406	411

Note: the means are weighted by number of households in each locality.

Table 5. Correlations between Dependent Variables and Explanatory Variables

	1983			1995		
Variable	Income	Housing	Autos	Income	Housing	Autos
Importance of agriculture	-0.358**	-0.050**	-0.132**	-0.351**	-0.078**	-0.233**
Population	0.007**	0.101**	0.023**	0.047**	0.121**	0.072**
Household size	-0.154**	-0.639**	-0.255**	-0.244**	-0.651**	-0.173**
Median age	0.090**	0.663**	0.153**	0.130**	0.592**	0.066**
Dependency ratio	-0.028**	-0.316**	0.015**	-0.198**	-0.205**	-0.116**
High school	0.058**	-0.024	-0.067**	-0.384**	-0.303	-0.484
Higher education	0.189 *	0.362**	0.480**	0.470**	0.417**	0.617**
Academic degree	0.195**	0.264**	0.357	0.501**	0.384**	0.609**
Labor participation	0.118**	0.151**	0.248**	0.426**	0.231**	0.431**
Prestigious job	0.240**	0.272**	0.433**	0.392**	0.335**	0.521**
Hired employees	-0.042	-0.082**	-0.131**	-0.085**	0.010	-0.078*
Distance to TLV	-0.080**	-0.284**	-0.299**	-0.107**	-0.305**	-0.172**
Year of establishment	-0.005**	-0.419**	-0.159 *	-0.048**	-0.356**	0.021**

* coefficient significant at 5%; ** coefficient significant at 1%

Table 6. Regression Results: Income Per Capita

	1983		1995		Pooled		Panel	
Variable	Estimate	T-value	Estimate	T-value	Estimate	T-value	Estimate	T-value
Intercept	2.665	3.180**	-0.143	-0.300	0.555	1.520		
Importance of agriculture	-0.268	-5.180**	-0.181	-7.670**	-0.213	-10.580**	-0.404	-8.680**
Population	0.114	1.130	0.011	0.220	-0.022	-0.520	-0.106	-0.550
Household size	0.151	1.340	-0.198	-3.150**	-0.145	-2.740**	0.021	0.230
Median age	-0.004	-0.520	-0.005	-1.180	-0.002	-0.460	0.004	0.640
Dependency ratio	-0.066	-0.920	0.024	0.670	0.035	1.190	-0.017	-0.310
High school	-0.003	-1.480	-0.005	-5.040**	-0.001	-1.160	-0.002	-1.280
Higher education	0.001	0.260	0.002	1.180	0.003	2.120*	-0.001	-0.630
Academic degree	0.015	5.010**	0.004	1.800	0.006	4.620**	-0.001	-0.440
Labor participation	-0.021	-4.490**	0.007	2.830**	-0.002	-1.010	-0.002	-0.660
Prestigious job	0.000	0.050	0.009	4.830**	0.004	3.050**	0.004	1.170
Hired employees	0.012	2.270*	0.003	1.150	0.010	6.240**	0.009	2.030*
Golan & East Galilee	0.004	0.890	-0.003	-1.760	-0.003	-1.800		
West Galilee	-0.112	-0.580	0.087	1.040	0.088	1.220		
Yizre'el & Lower Galilee	0.130	0.840	0.069	0.820	0.038	0.530		
East Valleys & Arava	0.215	1.870	0.015	0.190	0.086	1.390		
South	-0.102	-0.720	0.036	0.510	0.066	1.080		
Distance to TLV	0.142	1.740	0.117	2.370*	0.114	2.800**		
Year of establishment	0.000	0.320	0.001	1.240	0.000	-0.180		
1995 dummy					-0.962	-13.500**	-1.111	-14.060**
R squared (%)	0.583		0.560		0.685		0.512	
F statistic	6.920**		19.400**		50.140**		10.290**	
Number of cases	119		410		529		119	

* coefficient significant at 5%; ** coefficient significant at 1%

Table 7. Regression Results: Housing Density

	1983		1995		Pooled		Panel	
Variable	Estimate	T-value	Estimate	T-value	Estimate	T-value	Estimate	T-value
Intercept	24.322	0.860	98.199	5.660**	72.578	5.310**		
Importance of agriculture	2.906	1.660	-0.407	-0.470	0.320	0.430	0.981	0.580
Population	1.982	0.580	-4.561	-2.440*	-1.369	-0.870	-4.719	-0.680
Household size	-3.157	-0.830	6.350	2.760**	3.973	2.010*	4.689	1.420
Median age	0.862	3.510**	0.801	5.670**	0.817	6.680**	0.585	2.700**
Dependency ratio	-5.156	-2.130*	-13.519	-10.250**	-11.199	-10.260**	-7.554	-3.820**
High school	0.016	0.250	-0.070	-1.940	-0.044	-1.440	0.077	1.220
Higher education	0.130	1.570	0.126	1.770	0.041	0.870	0.086	1.060
Academic degree	0.155	1.560	0.193	2.610**	0.133	2.560*	-0.117	-1.160
Labor participation	0.161	1.020	-0.037	-0.430	-0.032	-0.440	0.263	1.970
Prestigious job	-0.099	-0.980	-0.051	-0.780	-0.075	-1.410	-0.150	-1.340
Hired employees	0.194	1.120	0.254	2.960**	0.225	3.940**	0.291	1.760
Golan & East Galilee	-0.258	-1.860	-0.058	-0.930	-0.079	-1.420		
West Galilee	7.321	1.130	4.131	1.340	5.250	1.950		
Yizre'el & Lower Galilee	7.745	1.490	4.234	1.370	5.423	2.040*		
East Valleys & Arava	2.194	0.560	5.547	1.990*	5.345	2.320*		
South	3.784	0.790	-3.001	-1.150	-0.255	-0.110		
Distance to TLV	5.384	1.950	-0.468	-0.260	2.106	1.390		
Year of establishment	-0.080	-2.180*	-0.065	-2.720**	-0.068	-3.370**		
1995 dummy					6.923	2.610**	8.030	2.800**
R squared (%)	0.732		0.624		0.640		0.326	
F statistic	13.540**		25.330**		40.940**		4.740**	
Number of cases	119		410		529		119	

* coefficient significant at 5%; ** coefficient significant at 1%

Table 8. Regression Results: Automobile Ownership

	1983		1995		Pooled		Panel	
Variable	Estimate	T-value	Estimate	T-value	Estimate	T-value	Estimate	T-value
Intercept	-17.473	-0.790	-53.774	-2.940**	-55.024	-3.920**		
Importance of agriculture	-0.377	-0.280	0.039	0.040	0.457	0.590	-3.569	-2.340**
Population	1.544	0.580	4.898	2.490*	6.696	4.150**	7.151	1.130
Household size	-1.101	-0.370	-8.018	-3.310**	-7.225	-3.560**	-6.543	-2.200**
Median age	0.080	0.420	-0.119	-0.800	-0.029	-0.230	-0.338	-1.730
Dependency ratio	2.665	1.410	2.294	1.650	1.595	1.420	0.303	0.170
High school	-0.042	-0.840	-0.053	-1.390	-0.008	-0.250	0.035	0.610
Higher education	0.137	2.110*	0.173	2.300*	0.115	2.360*	0.091	1.250
Academic degree	0.291	3.730**	0.310	3.960**	0.320	5.980**	-0.002	-0.020
Labor participation	0.040	0.330	0.192	2.110*	0.204	2.750**	0.349	2.900**
Prestigious job	-0.028	-0.350	0.122	1.780	0.034	0.620	-0.073	-0.730
Hired employees	0.059	0.430	0.367	4.060**	0.158	2.690**	0.315	2.120**
Golan & East Galilee	-0.083	-0.770	0.222	3.400**	0.214	3.740**		
West Galilee	7.293	1.440	4.081	1.260	8.158	2.950**		
Yizre'el & Lower Galilee	4.586	1.130	-4.041	-1.240	-1.131	-0.410		
East Valleys & Arava	0.164	0.050	1.602	0.540	1.046	0.440		
South	-0.526	-0.140	-3.704	-1.340	-1.167	-0.500		
Distance to TLV	0.339	0.160	-0.632	-0.330	-0.943	-0.600		
Year of establishment	-0.055	-1.910	-0.027	-1.050	-0.043	-2.070*		
1995 dummy					0.583	0.210	4.092	1.580
R squared (%)	0.479		0.529		0.525		0.304	
F statistic	4.560**		17.100**		25.420**		4.290**	
Number of cases	119		410		529		119	

* coefficient significant at 5%; ** coefficient significant at 1%