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Does rural household income depend on neighboring urban centers? Evidence from Israel

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Abstract. This *research explores the dependence of rural incomes on nearby urban centers, mostly implied by rural-to-urban and/or urban-to-rural selective migration. Migration flows are affected by wage differentials as well as differences in housing costs and other amenities, and by commuting costs and costs of migration. An income-generating equation, which includes characteristics of nearby urban communities among the explanatory variables, is estimated for rural households in Israeli moshav villages. The results show that the population of nearby urban communities is significantly and positively associated with rural household per-capita income. The same is true for mean income in these communities. In addition, distance from urban communities affects rural income negatively, suggesting that commuting costs are important determinants of the direction of the net migration of high-income households.*

Keywords: rural, urban, income, distance

JEL Codes: R23

1. Introduction

Rural-urban income disparity is well-known throughout the world (Young 2013). Changes in this disparity stem from shifts in the supply and demand for different types of labor that may be accompanied by rural-urban and/or urban-rural migration flows. Historically, rural households derived most of their income from agriculture. However, the gradual decline of farm incomes has led to a decline in the importance of farming in rural areas. While some households that quit farming have migrated to urban communities, others have remained in the rural area and derive an increasing fraction of their income from non-farm sources. This process is evident throughout the developed and developing world (Bryden and Bollman 2000; Gardner 2005). In addition, rural communities in developed economies that are rich in residential amenities attract urban households seeking quality of life (Rothwell et al. 2002; Mitchell 2004). The direction of pressures on rural incomes resulting from these migration flows depends on whether the earning abilities of incoming migrants are higher or lower than the earning abilities of the original rural population. This is an empirical question that has a bearing on both rural population issues (Renkow and Hoover 2000) and rural-urban inequality (Henderson and Wang 2005).

Topel (1986) discussed the impact of labor migration on local wages in a general equilibrium context. Bar-El (2006) suggested that the direction of labor migration could be determined by differential wages, differential housing prices, or both. So, Orazem and Otto (2001) showed that joint residential and work choices are made according to wages, housing prices and commuting costs. Gould (2007) showed that white-collar workers earn more in cities than in rural areas, but could earn more than their rural counterparts even after migrating to rural areas. El-Osta, Mishra and Morehart (2007) found that the economic well-being of

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farm households is higher in metro counties than in rural counties. Renkow (2003) used a spatial county-level econometric model and found that most employment growth during the 1980s in North Carolina counties was accommodated by changes in commuting flows, and that labor force growth in rural counties is sensitive to employment growth in nearby urban counties. Brown at al. (2015) established empirically that internal migration flows and commuting distance are positively related.

There is ample evidence, then, that rural households are affected by nearby urban areas (Partridge et al. 2007). On the one hand, one can expect a positive association between rural and (nearby) urban incomes, because higher urban incomes can be enjoyed by rural residents who commute to town for work, and because of the flow of high-income urban families into nearby rural communities (suburbanization). Chen and Rosenthal (2008) have shown that households prefer to reside in non-metropolitan areas, all else being equal. On the other hand, one can think of situations in which the association is reversed. For example, higher urban incomes may attract the more capable rural residents and induce them to migrate (brain drain), thereby reducing rural incomes. Hence, whether higher (nearby) urban incomes are associated with higher or lower rural incomes is an empirical question that may depend to a large extent on distance. For example, the importance of the brain drain phenomenon increases with commuting distance between the rural community and the urban center, because rural residents who find a job in the city will find it less attractive to commute daily as the distance increases. These residents will then choose between giving up the more attractive urban job and migrating to the city. Either way, average rural incomes will decrease. Partridge and Rickman (2008) found that income in remote rural areas is more sensitive to local labor market conditions than in non-remote rural areas. This is because non-remote rural labor markets are interlinked with nearby urban labor markets.

Another factor that may affect rural incomes is the size of the nearby urban center. Portnov (2004) found correspondence between the growth of small towns in Israel and their neighboring urban centers. A larger urban center generally constitutes a larger labor market with enhanced opportunities for rural residents (Jonasson and Helfand 2010). In addition, a larger urban center may increase the demand for rural goods and services, thereby enhancing the income of the rural population (Partridge et al. 2007). In both cases, distance plays the same role as discussed above, namely, rural incomes are likely to respond positively to increased urban population when the commuting and transportation distance is relatively small. The effect is likely to deteriorate with distance, and even be reversed beyond a certain distance. Khan, Orazem and Otto (2001) found that a local labor market is defined by a commuting distance of about one hour.

Here we examine this question in the context of Israeli rural communities. Israel presents a good case study because (a) the changes in agricultural technologies, market conditions and agricultural and rural policy have been relatively rapid (Ahituv and Kimhi 2006); (b) recent institutional changes have allowed a massive expansion of non-farm households in rural communities in the last decade, and (c) it is a relatively small country so that most rural communities are within a short commute from an urban center, and costs of migration are relatively low. In this study, we analyze household income data for a sample of rural communities in Israel, surveyed in early 2006, and examine the association of rural income with mean income and population of nearby urban communities, the latter data derived from income and social surveys conducted by the Central Bureau of Statistics (CBS).

The next section provides relevant economic and geographic background on the rural hemisphere in Israel. After that, we describe the empirical strategy and the data sources. The following section reports the empirical results. The paper ends with conclusions and avenues for future research.

2. The rural hemisphere in Israel

Agriculture had a critical role in the establishment of the state of Israel. Since the late 19th century, Jewish immigrants have seen agriculture as a channel through which the link between the Jewish people and their ancient homeland can be reestablished. Cooperation has been key to the success of agricultural settlement. The two dominating types of cooperative settlements were the kibbutz and the moshav (Kislev 1992). The kibbutz was a commune in which individual members produce according to their abilities and consume according to their needs (Lecker and Shachmurove 1999; Ingram and Simons 2002). The moshav was a cooperative village made up of individual family farms, in which certain activities, such as purchasing,

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marketing, and financing, were handled jointly in order to exploit economies of scale (Haruvi and Kislev 1984; Schwartz 1999; Sofer 2001). After Israel declared its independence in 1948, masses of immigrants started pouring in, and food security became a top priority. Many agricultural communities (especially moshav villages) were established in the early 1950s, mostly in remote areas, and populated by immigrants. The new settlers were provided with infrastructure and professional guidance to allow them to make a living off agriculture. Agricultural research and heavy investments in infrastructure have led to a remarkable technological progress. Israel quickly achieved self-sufficiency in food, but agricultural production continued to increase, which led to declining prices and lower farm incomes. The development of non-agricultural manufacturing 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 was by continuing farmers who supplemented their income by engaging in non-agricultural activities (Kimhi 2000; Sofer 2001). These included on-farm small businesses as well as off-farm businesses and non-farm jobs, located in part in the surrounding rural area and in part in nearby urban centers.

The farm debt crisis that followed the 1985 economy-wide stabilization plan was a major accelerator for this process. Many farms became practically delinquent due to the high real interest rates and could no longer fulfill their role as a source of living. Many cooperatives collapsed, leaving their members without the safety net and support system that had served them for decades (Kislev, Lerman and Zusman 1991; Schwartz 1999). Farmers increasingly shifted to alternative income-generating activities (Bittner and Sofer 2013), while the more productive farms were able to expand. Today, in most rural communities only a handful of families are living off agriculture. The population has become more heterogeneous, and inequalities within as well as between farm communities and regions have expanded (Sofer and Applebaum 2006; Kimhi 2009).

The official definitions of urban and rural in Israel is based on communities rather than on regions. In particular, municipalities with more than 2,000 residents are defined as urban, while those with less than 2,000 residents are defined as rural. Rural municipalities are organized in regional councils. Some regional councils encompass urban municipalities, while some regional councils are surrounded by urban regions. In this sense, the classification of rural and urban areas does not have a clear geographical dimension. This exacerbates the already problematic binary classification of geographic areas into urban and rural (Waldorf 2006). Over time, some rural communities will cross the 2,000 inhabitant threshold and become urban. It is therefore not easy to define local labor markets in Israel using the definitions of rural and urban.[1]

3. Theoretical foundation

A spatial equilibrium model of urban and suburban communities has been proposed by Wu (2010). In this model, the population, which is composed of high- and low-income households, chooses a community to reside in. This choice is affected by commuting distance, property values, property taxes and environmental amenities. The comparative static results show that a proportional increase in income of the two types of households can have a positive or negative effect on the number of high-income households in the suburb, and hence the effect on mean suburban income is ambiguous. In the case of a rural-urban equilibrium, the comparative static results can be vastly simplified. This is because in Wu's (2010) model, all suburban residents work in the metropolitan center, while local employment opportunities exist in rural communities. In particular, in the case of the Israeli moshav communities, working outside of the moshav was originally the exception rather than the rule (Kimhi 1998). We argue that if the costs of occupational migration are lower than the costs of residential migration, the equilibrium condition will be based on the decision of rural households who work in the village to work in the city and vice versa, rather than the decision of rural households who work in the city to migrate to the city. In this case, rural land values, property taxes and environmental amenities do not affect the equilibrium level of rural income.

Specifically, we use a simplified version of Wu's (2010) utility function, and assume that utility is a function of consumption (z), housing (q) and rural amenities (a): $U(z,q,a)$. Amenities are assumed to be positively associated with distance to the metropolitan center (x): $a'(x) > 0$. Income is spent on consumption, commuting and housing, hence the budget constraint is: $Y=z+dx+p(x)q$, where d is the cost of commuting

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per unit distance, and $p(x)$ is the price of housing, which is assumed to be negatively associated with distance: $p'(x) < 0$. For the marginal household that is indifferent between working in the village and working in the city, $U(Y^v\text{-}p(x)q^v,q^v,a(x))=U(Y^c\text{-}p(x)q^c\text{-}dx,q^c,a(x))$, where Y^v and Y^c are income in the village and income in the city, respectively. Also, q^v is the quantity of housing chosen by a person who works in the village, while q^c is the quantity of housing chosen by a person who works in the city. One possible equilibrium is one in which $q^v=q^c$, in which case the equality is satisfied if and only if $Y^v=Y^c\text{-}dx$. Comparative static results for this equilibrium are easy to obtain. Assuming that the city is much larger than the village, employment decisions of village residents do not affect income in the city. Consider an exogenous increase in Y^c. By the equilibrium condition, Y^v must increase as well. Similarly, an increase in commuting costs (d) will reduce village income, and village income will be lower in more remote villages.

The possibility that a higher utility of working in the village will be achieved with a lower level of q^v cannot be ruled out. In this case, the comparative static results are clearly ambiguous. However, this whole scenario becomes redundant if one assumes transaction costs associated with changes in housing.[2] Small changes in urban income will not affect village housing if the transaction costs are large enough. In this case, the only relevant comparative static result is the one associated with $Y^v=Y^c\text{-}dx$. We conclude that under fairly reasonable assumptions, small increases in urban income will lead to increases in rural income.

4. Empirical strategy and data

We use rural household survey data to estimate income-generating equations with an emphasis on spatial dimensions. Besides ordinary explanatory variables such as household demographic indicators and farm characteristics, the equations include community and location characteristics, proximity to urban localities, the population of these urban localities and their mean income. The main data source is a household survey that was conducted in moshav villages during March and April of 2006 and included 842 observations. The respondents provided information about their and their household's demographic characteristics, their status within the moshav (farm owner or resident), their farm characteristics (when relevant), the household's main source of income and the importance of agriculture as a source of income. Respondents were also asked about their gross income from different sources: farm income, non-farm business income, non-farm labor income, property income, and allowances.

Additional data were collected from various sources. Moshav information, including exact location (coordinates), year of establishment, and population was obtained from official publications of the CBS. Income per capita, location and population of urban localities were also obtained from CBS official data sets. Municipal expenditures of the regional councils were obtained from the Ministry of the Interior.

Preliminary analysis showed that rural income per capita (NIS 3,624 per month on average) is not very different from the urban income per capita (NIS 3,919 per month on average for the country as a whole). However, income inequality among rural households is higher than among urban households (Kimhi 2009). Farm-operating households have higher incomes than households residing on inactive farms, while the income of non-farm rural households lies between these two extremes. These income disparities have a considerable geographic dimension, with higher disparities in relatively remote regions. Slightly over half of household income on active farms is derived from farming. Other households derive most of their income from non-farm labor. Inactive farm owners are older on average, and hence derive a larger fraction of their income from property and allowances. This also explains why their total income is in general the lowest.

The household-level explanatory variables included personal characteristics of the respondent (age and education), the demographic structure of the household (female-headed, household size and dependency ratio), and attributes of the farm. These included whether the household owns a farm, fraction of income from farming, and landholdings. A farm is a source of income on the one hand, but on the other hand, many low-income retirees still own farms. This should be dealt with by controlling for the fraction of income from farming. Although Kimhi (2011) found that a higher fraction of farm income is associated with lower per-capita income, using earlier data, this is not necessarily true in our sample. The size of landholdings is expected to affect per-capita income positively, because farmland may be rented out even when it is not operated by the owners. Community-level explanatory variables were also used. One such variable was

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village population (for the year 2002), which has also been found to be a relevant variable elsewhere (Smailes, Argent and Griffin 2002), possibly due to agglomeration effects in both income-generating activities and residential amenities. Another community attribute was year of the village's establishment. We used a dummy variable for villages that were established between 1949 and 1959 (the years of mass immigration) and another dummy variable for villages that were established after 1959. We also included a dummy variable for villages belonging to the religious movement Hapo'el Hamizrahi. Both year of establishment and institutional affiliation have been shown to be proxies for the institutional structure of the moshav cooperative (Kimhi 1998), which is likely to affect income.

The principal explanatory variables were the population and average household income of urban localities over 20,000 inhabitants. There are 49 such localities in Israel. Since we wanted to include a single variable of urban population and a single variable of urban income, we weighted these variables by geographical distance and aggregated across all urban localities. This means that the effect of urban income on rural income is proportional to the inverse of the distance between the two localities. While this proportionality is arbitrary, we experimented with different proportionality rules and did not get qualitatively different results. Jonasson and Helfand (2010) used the same strategy in their Brazilian study. Finally, we included the per-capita municipal expenditures of the regional council as a proxy for residential amenities in the rural area. The sample means of all explanatory variables are presented in Table 1.

Table 1. Variable definitions and sample means

Variable		Sample mean	Unit
Income	ln (per-capita monthly gross household income)	7.80	NIS
Urban income	Monthly household income divided by distance, averaged over urban localities	1.67	NIS/km
Urban population (in thousands)	Urban population divided by distance, averaged over urban localities	0.939	1,000/km
Distance to town	Distance to nearest town of over 20,000 residents	10.76	km
Distance to large town	Distance to nearest large town of over 100,000 residents	25.51	km
Distance to Tel-Aviv	Distance to Tel-Aviv	61.83	km
Female		0.58	dummy
Age		49.77	years
High school		0.41	dummy
Higher education		0.19	dummy
Academic degree		0.29	dummy
Family size		3.59	count
Dependency ratio	Number of household members 0-18 and 65+ divided by number of household members 19-64	0.59	ratio
Village population (thousands)		0.48	1,000
Village established '49-'59		0.63	dummy
Village established '60+		0.19	dummy
Hapo'el Hamizrahi	Moshav belongs to the religious settlement movement of Hapo'el Hamizrahi	0.13	dummy
Farm owner	Household owns a farm unit	0.63	dummy
Income share of farming		0.15	fraction
Landholdings (in thousands)		0.03	1,000 dunam (0.23 acres)

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Municipal expenditures	Per-capita annual municipal expenditures of regional council, averaged over 1995-1999	6.36	1,000 NIS

5. Results

The estimation results are in Table 2. The dependent variable is the log of per-capita monthly gross household income from all sources. We present different specifications with different combinations of urban income and population variables. The first specification includes both income and population of all urban localities over 20,000 inhabitants, each weighted by distance. While the coefficient of urban population is positive and statistically significant, the coefficient of urban income is negative and insignificant. We suspect that this is due to multicollinearity. Because each of these variables (population and income) is weighted by the same distance variable, the correlation between the two weighted variables is close to 98%. In the next two specifications, we exclude each of these explanatory variables at a time. Specification (2) excludes income, and this yields a much smaller but equally significant coefficient of population. Specification (3) excludes population, and in this case, the coefficient of income is positive and just barely misses statistical significance at the 5% significance level. In the next three specifications, we reconstruct the urban income and population variables but include only cities over 100,000 inhabitants. The logic behind this is the possibility that a town with a population of 20,000 is perhaps not relevant for the rural population as an employment center. In this case, specification (4) shows that the coefficients of urban income and population reverse signs compared to specification (1), and neither of them is statistically significant. Specifications (5) and (6), on the other hand, show that each of the urban income and population variables affect rural income positively, supporting our hypothesis that urban centers have a positive effect on rural well-being.

Thus far, distance from urban centers has not been treated explicitly: it only served as a deflator of urban income and population. However, distance from town can have an independent effect on rural incomes. In Table 3, we present regression results in which distance from town serves as an explanatory variable. We present three alternative specifications. The first specification uses distance to the nearest town of at least 20,000 residents. The coefficient of this variable is positive and insignificant. The second specification uses distance to the nearest large urban center of at least 100,000 residents. Here, the coefficient of distance is negative, as expected, and statistically significant. We then estimated a third specification with the distance from Tel-Aviv, the largest urban center and the business capital of Israel. Distance to Tel-Aviv has a significant negative effect on rural incomes, although the coefficient is smaller in magnitude than in the previous specification. We also tried to allow a non-linear effect of distance on rural incomes, to test the hypothesis that the urban effect diminishes with distance due to commuting costs (Khan, Orazem and Otto 2001, So, Orazem and Otto 2001, Partridge et al. 2007). However, the non-linear effect did not come out statistically significant.

The coefficient estimates of the other explanatory variables are mostly robust to the different specifications presented in Tables 2 and 3. Female-headed households have lower per-capita income. Age does not seem to affect rural income significantly. Rural per-capita income responds positively to education, but negatively to family size. The age composition of household members, represented by the dependency ratio, does not affect income significantly. Income increases with the village population, indicating positive agglomeration externalities, which could reflect both earning opportunities and/or residential amenities. Village age, a proxy for institutional factors, has a significant effect on income. In particular, income is significantly lower in villages established between 1949 and 1959, the years of mass immigration. Income is also lower in villages associated with the Hapo'el Hamizrahi settlement movement, which serves as another institutional proxy. A set of farm-related explanatory variables, including a dummy for being a farm owner, the income-share of farming, and landholdings, does not affect rural income significantly, although the positive coefficient of landholdings is significant in one of the specifications. The level of municipal expenditures has a positive effect on rural incomes, as expected, but the coefficient was not statistically significant in most of the specifications. We also tried to include additional explanatory variables such as ethnic origin and regional dummies, but these did not have statistically significant effects on rural per-capita income, and their exclusion did not affect the other coefficients.

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Table 2. Estimation results of rural per-capita income as a function of urban attributes[a]

	All urban localities			Large urban localities		
Variable	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	7.645	7.618	7.683	7.736	7.685	7.697
	(24.3)**	(24.0)**	(24.0)**	(24.0)**	(24.6)**	(24.9)**
Urban income	-0.138		0.091	0.710		0.289
	(-1.57)		(1.97)	(1.72)		(3.00)**
Urban population	0.053	0.025		-0.062	0.040	
	(2.72)**	(2.77)**		(-1.05)	(2.91)**	
Female	-0.161	-0.155	-0.153	-0.156	-0.159	-0.158
	(-2.73)**	(-2.63)**	(-2.61)**	(-2.67)**	(-2.68)**	(-2.67)**
Age	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002
	(-0.71)	(-0.71)	(-0.73)	(-0.76)	(-0.70)	(-0.72)
High school	0.247	0.248	0.252	0.247	0.247	0.246
	(1.98)*	(1.99)*	(2.02)*	(1.98)*	(1.97)	(1.97)
Higher education	0.505	0.505	0.513	0.496	0.501	0.498
	(3.57)**	(3.58)**	(3.63)**	(3.46)**	(3.52)**	(3.49)**
Academic degree	0.692	0.697	0.708	0.690	0.692	0.690
	(4.97)**	(4.99)**	(5.03)**	(4.88)**	(4.92)**	(4.89)**
Family size	-0.109	-0.108	-0.109	-0.107	-0.108	-0.108
	(-5.89)**	(-5.85)**	(-5.81)**	(-5.72)**	(-5.75)**	(-5.74)**
Dependency ratio	-0.013	-0.008	-0.001	-0.018	-0.011	-0.015
	(-0.15)	(-0.09)	(-0.01)	(-0.21)	(-0.13)	(-0.16)
Village population	0.397	0.448	0.507	0.423	0.438	0.428
	(2.33)*	(2.57)*	(2.89)**	(2.42)*	(2.54)*	(2.47)*
Village established '49-'59	-0.285	-0.256	-0.242	-0.265	-0.277	-0.273
	(-2.97)**	(-2.80)**	(-2.50)*	(-2.89)**	(-3.04)**	(-2.98)**
Village established '60+	-0.199	-0.180	-0.188	-0.192	-0.200	-0.195
	(-1.34)	(-1.22)	(-1.25)	(-1.29)	(-1.35)	(-1.32)
Hapo'el Hamizrahi	-0.166	-0.163	-0.159	-0.181	-0.169	-0.174
	(-1.64)	(-1.58)	(-1.48)	(-1.76)	(-1.66)	(-1.71)
Farm owner	-0.012	-0.008	-0.008	-0.006	-0.011	-0.009
	(-0.20)	(-0.14)	(-0.14)	(-0.10)	(-0.19)	(-0.15)
Income share of farming	-0.030	-0.043	-0.057	-0.052	-0.037	-0.042
	(-0.22)	(-0.32)	(-0.42)	(-0.39)	(-0.28)	(-0.31)
Landholdings	0.099	0.096	0.084	0.090	0.095	0.094
	(1.54)	(1.50)	(1.35)	(1.39)	(1.45)	(1.43)
Municipal expenditures	0.027	0.028	0.025	0.025	0.025	0.025
	(2.08)*	(2.15)*	(1.84)	(1.92)	(1.94)	(1.97)
R-squared	0.206	0.204	0.199	0.206	0.204	0.205
Observations	794	794	794	794	794	794

a. t-statistics in parentheses are based on standard errors that are clustered by village.
* coefficient significant at 5%. ** coefficient significant at 1%.

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Table 3. Estimation results of rural per-capita income as a function of distance to town[a]

Variable	Distance to town	Distance to large town	Distance to Tel-Aviv
Intercept	7.892	8.136	8.096
	(25.07)**	(24.98)**	(26.03)**
Distance	0.003	-0.008	-0.003
	(1.43)	(-2.67)**	(-2.53)*
Female	-0.159	-0.162	-0.161
	(-2.69)**	(-2.77)**	(-2.73)**
Age	-0.002	-0.003	-0.002
	(-0.78)	(-0.96)	(-0.81)
High school	0.265	0.255	0.259
	(2.09)*	(2.05)*	(2.09)*
Higher education	0.538	0.525	0.526
	(3.74)**	(3.67)**	(3.69)**
Academic degree	0.734	0.695	0.702
	(5.08)**	(4.94)**	(5.05)**
Family size	-0.112	-0.110	-0.109
	(-5.72)**	(-5.70)**	(-5.75)**
Dependency ratio	0.009	-0.009	-0.005
	(0.10)	(-0.10)	(-0.06)
Village population	0.546	0.450	0.453
	(3.18)**	(2.66)*	(2.68)**
Village established '49-'59	-0.268	-0.301	-0.291
	(-2.69)**	(-3.51)**	(-3.41)**
Village established '60+	-0.249	-0.135	-0.182
	(-1.63)	(-0.92)	(-1.25)
Hapo'el Hamizrahi	-0.149	-0.148	-0.166
	(-1.30)	(-1.30)	(-1.54)
Farm owner	-0.021	-0.006	-0.012
	(-0.36)	(-0.09)	(-0.20)
Income share of farming	-0.056	-0.046	-0.030
	(-0.40)	(-0.34)	(-0.23)
Landholdings	0.063	0.123	0.113
	(1.02)	(2.08)*	(1.86)
Municipal expenditures	0.013	0.022	0.025
	(0.92)	(1.69)	(1.94)
R-squared	0.192	0.205	0.203
Observations	794	794	794

a. t-statistics in parentheses are based on standard errors that are clustered by village.
* coefficient significant at 5%. ** coefficient significant at 1%.

6. Conclusion

In recent years, evidence has emerged for a spatial dependence between rural and urban communities, and in particular, a dependence of rural incomes on nearby urban areas. This dependence is mostly implied by rural-to-urban or urban-to-rural selective migration (or both). Migration flows can be affected by differential wages, housing costs and other amenities, and by commuting costs and costs of migration. This

paper explored the spatial rural-urban dependence in Israel, by estimating a rural income-generating equation that includes characteristics of nearby urban communities among the explanatory variables. We found that both the population of nearby urban communities and the mean income in these communities had positive effects on rural household per-capita income, while distance from urban communities had a negative effect. The effects of population and income suggest that earning opportunities in urban centers as well as residential amenities affect rural-urban residential and occupational migration flows in both directions. The negative effect of distance suggests that commuting costs are important determinants of the direction of the net migration of high-income households.

Our empirical analysis was limited by the somewhat artificial distinction between rural and urban communities in Israel: whereas communities with fewer than 2,000 residents are considered rural, larger communities are considered urban even if they are remote from major urban centers. One way to deal with this issue in future research is to examine alternative definitions of urban and rural areas based on the notion of local labor markets.

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Notes

[1] In contrast, in a much larger country such as Canada, it is easier to define rural and urban areas with limited commuting possibilities (Munro, Alasia and Bollman 2011).
[2] Henning, Zarnekow and Kaufmann (2013) have established the role of transaction costs in rural migration decisions.

8. References

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