Intergenerational Succession in Israeli Family Farms: 1971-1988[1]

Ayal Kimhi, Yoav Kislev, and Shlomit Arbel

Introduction

Intergenerational succession is an event of major importance in the life cycle of the family farm. The reasons are both emotional, as farm families attach a symbolic value to the land they operate (Carrol and Salamon 1988), and economic, as there are advantages to the continued operation of the farm business beyond the life cycle of the current owners (Friedberger 1983). The economic considerations favor succession by a child, since farm-specific human capital is a by-product of being raised on a particular farm (Rosenzweig and Wolpin 1985). Also, transferring the farm to one's children has tax advantages in certain economies (Boehlje and Eisgruber 1972).

Patterns of intra-family farm succession vary according to tradition, economic conditions, and the institutional setup (Gasson and Errington 1993, chapter 7). Often, the farm is not large enough to support more than one family, and hence succession by one child is favored. Even when equity and tax considerations provide a strong enough incentive to divide the farm among all heirs, the final consequence is often that one heir ends up buying the others' parts (Tauer 1985). In Israeli moshavim, the focus of our analysis, succession by one child only is implied by institutional regulations. Hence, throughout the discussion we will deal with the case of a single successor.

Ignoring the question of choice of successor (Kimhi 1995), we will concentrate on the time pattern of succession. Many different time patterns are observed in different countries (Blanc and Perrier-Cornet 1993). A major problem, especially in empirical studies of farm succession, is to distinguish between the legal transfer of property rights to the successor and the transfer of responsibility for the farm operation. Several empirical findings indicate that the latter is gradual (Coughenor and Kowalski 1977; Errington 1993/94), which makes sense from a human capital point of view. Estate tax considerations in the United States provide an incentive for gradual legal transfer as well (Stevens 1985), and gradual legal transfer is also observed in several European countries (Blanc and Perrier-Cornet 1993).

The legal ownership transfer and the responsibility transfer will not occur at the same time even without tax considerations. This is because of uncertainty about future events which leads to conflicts between parents and succeeding children (Kimhi 1995). These conflicts lead to the desire of parents to transfer the farm as late as possible, while potential successors wish to gain legal ownership of the farm as early as possible. The outcome could be that a designated successor gives up and finds an alternative occupation, or that he limits his involvement in farm management and perhaps works part-time off the

[1] Chapter 19 in *Intergenerational Transfers of Farmers in Different Institutional Environments*, BARD Project IS-1845-90 Final Report by Yoav Kislev, Ayal Kimhi, and Ramon Lopez, 1995.

farm as an insurance mechanism. This is supported by the findings of Friedberger (1988, p. 82-83), that farms which were transferred to a successor *inter vivos* were most likely to be retained by the same family for more than one generation.

Most Israeli family farms belong to moshavim (semi-cooperative villages). The institutional structure of moshavim is consistent with a single successor inheritance pattern. On one hand, farm families lease their land from the national land authority on a long-term basis, and transfer of the lease is permitted only if approved by the cooperative's constitutional body. On the other hand, the cooperative will approve such a transfer only if made to a member, and membership regulations imply that only one of each member's children can be accepted as a member alongside his parents (Regev 1994). The bottom line is that members have two choices: (a) choosing one of their children as a "succeeding child"; or (b) selling the farm including the family residence and moving out of the village (again, only if the buyer was approved by the cooperative). A third possibility, which is sometimes chosen by default, is not to choose a successor and let the children fight over the inheritance after their death.

Being approved by the cooperative as a "succeeding child" carries mainly two benefits: (a) membership in the cooperative; and (b) the right to build another house on the parents' plot. The value of the first benefit seems to decline over time while the value of the second seems to rise. In any case, succeeding children can get property rights only if these rights are no longer held by the parents. This could be either (a) if the parents give the rights *inter vivos*, or (b) after the parents' death, if specified in a will or court order. No formal partnership is allowed between parents and succeeding children (or anybody else), although courts tend to recognize informal partnerships when ruling in conflicts. Therefore, gradual transfer of property rights is not permitted. The transfer is delayed as a result of the parents' unwillingness to give up everything in favor of the child, and the responsibility transfer is also delayed as a result of the child's unwillingness to engage in an activity whose future is unclear.

One way that farm families used to avoid the inefficiencies implied by these institutional regulations was to purchase another farm for one (or more) of the children in the same moshav. This child could then start farming on his own or form a partnership with the parents' farm (a limited partnership between two different farm units is allowed in a moshav). The problem is that a child who has a farm of his own cannot be chosen as a succeeding child. Hence, if the parents want their farm to continue operating into the next generation, they have to choose another child as a succeeding child. This arrangement could work best in case an elder child is willing to succeed while the parents are still relatively young and in full shape, and there exist other (younger) potential successors). However, it can be carried out easily only when farm units in the moshav are relatively cheap to acquire. Today, it is only applicable in remote areas.

The question is how important are the adverse effects of these institutional regulations. If the advantage of intra-family succession is the functioning of the family farm as a "going concern," and if the institutional regulations delay the time of ownership transfer, then one could, in principle, calculate the loss of potential income due to the delay. However, in some farms, a delay of transfer may result in no succession at all, because the designated successor has already decided to seek an alternative income,

or because by the planned transfer time the farm is not attractive anymore. Hence, the cost of the strict succession regulations is even higher.

A major determinant of this cost is the effect on farm performance of a transfer from an old owner to a young successor. Empirical evidence suggests that profitability of small firms rises with the age of the operator, due to accumulation of physical and human capital, and eventually declines due to a shorter planning horizon, lack of incentives to invest, and health problems (Evans 1987). This argument can easily be extended to family farms. The results of Kimhi (1994) on the timing of farm transfer to a successor are also consistent with this stylized fact. However, if the operation of the farm is gradually transferred to the succeeding child regardless of the formal ownership, we will not expect actual ownership transfer to affect farm profitability. This is the major hypothesis that we intend to test in this paper.

Even if farm profitability has the concave age profile depicted above, it may not be independent of succession considerations. For example, lack of incentives to invest may be reduced by the expectation that a child will take over the farm in the future. Therefore, another thing we would like to test is whether the expectation of future intergenerational succession raises farm size, performance, and capital intensity in the present. Griliches and Regev (1993) found that a business firm that is about to close in the next ten years is 5%-10% less productive in the present, and denoted this effect as the "shadow of death." While this holds for family farms as well, we could argue that a similarly defined "shadow of succession" has the opposite effect. This is another hypothesis that we intend to test below.

The main objective of this paper is to examine the effects of succession considerations on family farm performance. In particular, we will concentrate on the actual ownership transfer and not on the transfer of responsibility. The latter will be dealt with in future research. For this purpose, we use a panel data set of family farms in moshavim, in which the identity of the farm owner is reported. Farms were surveyed at four different time periods between 1971 and 1988, and this, together with information on family members, enable us to identify farm ownership transfers with a great degree of reliability, and determine to whom the farm was transferred.

Data

The panel data set use in this research was extracted from a much broader data base. The data base comprises three different data sets that were constructed on the basis of four different statistical operations: (1) the 1971 Census of Agriculture; (2) the 1975-76 survey of family farms; (3) the 1981 Census of Agriculture; and (4) the 1988 survey of farms.

Description of the statistical operations

The 1971 Census of Agriculture encompassed all the agricultural population in Israel. It included physical measures of land use by crop, numbers of livestock by type, and farm capital (machinery and equipment), as well as demographic information. No monetary variables were collected. Alternatively, a set of norms was constructed for production, value of production, percent of value added in the value of production, labor input, and water use. Norms were constructed for each

crop and type of livestock, by region. The norms for value of production, for example, were computed as the average yield per dunam (about a quarter of an acre) of land for each crop in each region, or as the average return to a unit of livestock sold in each region. The norms for value added and capital stock were calculated similarly.

The 1975-76 survey was conducted on a representative sample of 574 family farms in Israel. The sample was representative of the family-farm population in 1975 in terms of crop diversity, geographical location, and institutional affiliation. 510 of the sample farms belonged to moshavim. The survey included a very thorough economic investigation. Income and expenses were recorded for every crop and type of livestock by month, and these values were used eventually to derive several economic indicators on the farm level, such as profits and changes in debt. The survey was conducted over a two-year period, so that each farm was surveyed twice. Due to the relatively high inflation at that time, all the values were transformed to fixed 1976 prices.

The 1981 Census of Agriculture is quite similar in nature to the 1971 Census. The definition of farm population was more flexible than in 1971, allowing families that live in agricultural villages to be included even if their agricultural activity was practically nonexistent. The demographic information collected in 1981 was more detailed that in 1971. Agricultural data was collected in physical units, and a set of norms was constructed in a fashion similar to that of 1971.

The purpose of the 1988 survey was to get back to the same 510 moshav farms surveyed in 1975-76 and study the changes in farm structure since then. Only 435 responses were obtained. The questionnaire was based on the 1981 Census, with the addition of several questions regarding the previous farm operator, and the way the farm was obtained.

Description of the data sets

The basic data file used for this study covers part of the information collected in the 1975-76 survey (the original file was not found). The file includes land use by major crop category, number of livestock by type, and value added by the same categories. Also included are days of work on and off the farm, income by source, and several personal characteristics of the farm operator. Variables are reported separately for 1975 and 1976, all in 1976 values.

Following the administration of the 1981 Census, the Central Bureau of Statistics performed a matching of observations in the two censuses. Matching was performed by name, so that farms that changed hands between the two census years were not recorded as a successful match. Farms that changed hands within the family were recorded as a match in most cases, but we suspect that the matching process missed some of those farms, especially when the farm was transferred to a son-in-law with a different last name. In the file that was created after the matching process, physical quantities were aggregated into seven major groups: (1) fruits; (2) field crops; (3) vegetables; (4) flowers; (5) poultry; (6) cattle; and (7) other livestock. The calculated normative variables were aggregated accordingly, with the exception of value added in 1971, which was not calculated originally.

The data from the 1988 survey included only the original variables, without any modification, aggregation, or calculation of normative values.

Preparation of the combined data base

Most of the work on the data other than matching observations was to get comparable information on value of production, value added, and capital stock, across the years. This was no easy task, since different data sets had different definitions of variables and different units of measure. We have decided to create a data sets with four similar lines for each farm: (1) the data from 1971, taken from the matched 1971/81 census file; (2) averages of the 1975 and 1976 variables; (3) the data from 1981, taken from the matched 1971/81 census file; and (4) data from 1988. The included variables can be divided into eight groups: (a) variables that identify the farm and its location; (b) personal characteristics of the farm operator and his time allocation; (c) physical farm attributes, such as land by crop, livestock by type, and machinery (especially tractors); (d) total family farm labor input and off-farm labor supply, and water use; (e) normative value of production by crop and type of livestock; (f) normative gross value added by crop and type of livestock; (g) normative capital stock by crop and type of livestock; and (h) normative capital stock by type of asset. In the following sections we describe the procedures by which the data from the different files were brought to a common ground.

The 1971 data did not include normative value added. We used the 1981 norms to calculate these. However, we did not have the detailed physical variables necessary to repeat the calculation as it was done originally. Hence, we calculated the average fraction of value added in the value of production for each of the seven major groups of farm products described above, and multiplied it by the normative value of production in 1971.

The 1975-76 data were more detailed that the other data sets, therefore we aggregated variables whenever necessary. We also changed a few definitions to make them compatible with the census definitions, and we averaged the 1975 and 1976 data because there was little variability between these two years anyway. These averages will be denoted below as the 1975/6 data.

We did not have to modify the 1981 data since its structure and definitions matched the file we wanted to create. The 1988 data, however, were still in the original form, so we had to perform all the calculations and aggregations. Specifically, we calculated normative values of production, value added, and capital stock, and aggregated them into the seven major groups of products. The only difference in the calculations was that in 1971 and 1981 norms were applied by region, while we used the national average of the norms for the whole 1988 sample.

All the monetary variables were expressed in fixed 1981 prices. Value of production and value added were transformed using the consumer price index, while capital stock was transformed using a price index of agricultural inputs received from the Bank of Israel.

The final (and perhaps most important) action was to go back to the original questionnaires and record the occasions of changes of farm ownership between the data years. We have differentiated between transfers from a parent to a child and transfers to someone from a different family. We have also recorded occasions in which a farm was declared as inoperative in a specific year, meaning that it was not operated by its owner (in most cases the land was rented out). Overall, we have observations on 324 farms in 1971, 490 in 1975/6 (for 102 of those we do not have the questionnaires, so the succession information is missing), 400 in 1981, and 393 farms in 1988. The definitions of the main variables in this data set are presented in table 1.

Table 1. Definitions of main variables in the panel data set

Village-specific variables
1) establishment year - divided into three groups: old villages, young villages, and an intermediate group.
2) district - divided into three groups according to location (north, south, center) and into two groups according to landscape (mountain, non-mountain).
Operator-specific variables
3) succeeding child - a dummy variable indicating whether the current operator has himself become a succeeding child on this particular farm after 1971 (not available in 1971).
4) ethnic origin - a dummy variable indicating whether the current operator is of Asian/African origin (1) or other (0).
5) nativity - a dummy variable indicating whether the current operator was born in Israel (1) or not (0).
6) age.
7) years of schooling (not available in 1971).
8) off-farm work - a qualitative variable indicating the relative amount of time devoted to off-farm work, where a value of 10 stands for full-time (the variable may also take the values of 3 and 6, except for in 1971 where it may take the values of 5 and 10 only).
9) farm work - defined similarly to the off-farm work variable (not available in 1975/6).
Farm- (or family-) specific variables
10) succession status - divided into three groups: farms who were transferred to a child since the last period, farms who are operated by the same operator as last period, and farms who were sold outside the family since last period (not available in 1971).
11) number of family members.
12) number of family members over the age of 14 (not available in 1971).
13) shadow - a qualitative variable indicating whether the farm is going to be transferred to a child (1), sold outside the family (2), or operated by the same person (0) prior to 1988 (not available for 1988).
14) farm work - adding up the individual farm work variables (defined above) of all family members.
15) off-farm work - defined similarly to the family farm work variable.
16) operative - a dummy variable indicating whether the farm is operated by its owner in this period (1) or not (0).
17) cultivated land.
18) value of production - normative (see text; not available for 1975/6).
19) value added of crops - normative (except for 1975/6); see text.
20) value added of livestock - defined similarly to crops.
21) capital stock - normative (except for 1975/6); see text.

The effect of succession on farm size and performance

The first thing we want to investigate is what changes took place on the farm following intergenerational succession. For this purpose, we first compare farm characteristics before and after succession, for two different groups of farms: (a) "succession farms," which were transferred to a child between two consecutive periods; and (b) "continuation farms," which continued to be operated by the same individual. A third group, in which the farm was transferred outside the family, was excluded (as well as farms for which the information about succession was unclear). The results of the comparison are reported in table 2.

Table 2. Farm characteristics before and after succession: a comparison of "succession" farms (farms that were transferred to a child during the period) and "continuation" farms (farms that were not transferred during the period).

	"Succession" farms		"Continuation" farms	
	Before	After	Before	After
1971-1975/6				
number of farms	9		202	
cultivated land	34.44	53.33	25.57	28.79
value added - crops	52.91	114.53	55.25	45.54
value added - livestock	96.39	132.47	96.05	81.85
capital stock	1086	1743	852.3	1039
farm work - head	6.75	----	7.679	----
farm work - other	12.03	----	8.641	----
off-farm work - head	2.50	2.78	3.40	3.79
off-farm work - other	6.94	4.08	7.11	3.48
1975/6-1981				
number of farms	10		287	
cultivated land	18.80	26.80	28.49	21.92
value added - crops	32.62	125.84	42.87	96.49
value added - livestock	69.78	39.96	72.83	77.21
capital stock	831.6	879.7	924.0	928.6
farm work - head	----	8.5	----	5.669
farm work - other	----	4.1	----	4.541
off-farm work - head	2.50	3.60	3.90	3.21
off-farm work - other	2.21	10.0	4.03	5.69
1981-1988				
number of farms	22		242	
cultivated land	21.64	24.45	21.74	22.52
value added - crops	89.29	115.69	97.42	114.67
value added - livestock	75.91	90.71	73.98	76.73
capital stock	1010	963.1	936.4	952.0
farm work - head	4.091	4.364	5.872	3.616
farm work - other	6.909	2.909	4.248	3.194
off-farm work - head	0.91	5.32	3.77	3.34
off-farm work - other	3.10	3.00	5.61	6.13

Table 2 (continued)

	"Succession" farms		"Continuation" farms	
	Before	After	Before	After
1971-1988				
number of farms	43		139	
cultivated land	29.91	30.16	24.47	20.6
value added - crops	44.92	198.89	52.46	97.15
value added - livestock	102.08	116.11	100.44	78.75
capital stock	991.9	1551	892.5	920.7
farm work - head	8.152	5.372	7.618	3.950
farm work - other	10.36	1.698	6.622	3.424
off-farm work - head	2.485	4.349	3.676	2.712
off-farm work - other	6.538	4.070	6.364	5.907

First we look at farm characteristics in 1971 and 1975. In 1971, succession farms are on average larger than continuation farms, both in terms of cultivated land and in terms of capital stock. However, normative value added is about the same in the two groups of farms. This could be because succession farms engaged in crops with low value added, and had more unproductive capital assets, relative to continuation farms. But the striking differences between the two types of farms appear in the 1975/6 data. While continuation farms grew at modest rates of 13% in cultivated land and 22% in capital stock, succession farms increased their cultivated land and capital stock by 55% and 60%, respectively. Moreover, while continuation farms did not seem to get higher value added in 1975 (one should be cautious with exact comparisons since the 1975/6 variables are not normative), succession farms increased their livestock value added by more than a third, and more than doubled their crop value added. This is a strong indication of farm expansion - both in size and intensity - following intergenerational succession. It may also indicate easier mobility towards more profitable crops - especially export crops - during the succession stage.

Turning to the changes occurring in the farms between 1975/6 and 1981, we now see that initially succession farms are much smaller than continuation farms, especially in terms of cultivated land but also in terms of the capital stock. However, while cultivated land rose by 43% by 1981 in succession farms, continuation farms cultivated 23% less land than in 1975/6. Capital stock remained relatively the same in all the farms. Value added in continuation farms remained stable in livestock, but more than doubled in crops. The difference between crops and livestock growth was much larger in succession farms: livestock went down by close to a half, while crops went up close to four times. These numbers indicate more strongly than in the 1971-1975/6 comparisons that the relative growth of farms following succession occurs only in crops, not in livestock. It seems that successors tend to quit livestock production rather than expand it.

The story is much different in the last comparison, between 1981 and 1988. No striking difference is observed between succession farms and continuation farms, neither in size, nor in growth, nor in intensity. However, there are some differences in the labor input and labor supply variables. While operators of continuation farms reduced their farm labor input significantly between 1981 and 1988, succeeding children in 1988 worked quite as much on the farm as their parents did in 1981. On the other hand, while operators of continuation farms almost maintained in 1988 their level of off-farm

work in 1981, succeeding children in succession farms worked more than half time on average off the farm, compared to their parents who hardly worked off the farm. This perhaps explains the surprising lack of growth on succession farms between 1981 and 1988: successors spent most of their time working off the farm rather than expanding the farm operation.

The different stories one can tell according to the three different comparisons are determined at least in part by global changes in the economic environment. The 1970's brought about incentives to shift to export crops, while the 1980's were dominated by a sharp deterioration of the terms of trade in agriculture. The worse market conditions, accompanied by the anti-inflationary economic policy, resulted in a financial crisis whose outcomes are still felt ten years later.

The bottom section of table 2 compares the changes in the two groups of farms over the whole 1971-1988 period. As expected, the comparison reveals all the information observed above. This is true despite the fact that the group of succession farms includes farms that were transferred in 1972 as well as farms that were transferred in 1987. Perhaps this strengthens the conclusions a bit because we have many more succession farms in this comparison.

Table 3. Regression results of value added ratios

Variable	1971-1981		1981-1988		1971-1988	
	Estimate	t-value	Estimate	t-value	Estimate	t-value
constant	1.74	(0.57)	1.61	(3.71)**	1.30	(1.05)
old moshav	-0.96	(-0.28)	0.17	(0.42)	0.44	(0.35)
intermediate moshav	1.08	(0.47)	-0.13	(-0.41)	-0.15	(-0.15)
northern moshav	-0.21	(-0.09)	0.01	(0.02)	1.52	(1.97)*
southern moshav	-1.81	(-0.94)	-0.15	(-0.54)	0.25	(0.36)
mountain region	-1.40	(-0.74)	-0.34	(-1.32)	-1.09	(-1.54)
Israeli native	0.75	(0.28)	0.14	(0.55)	0.74	(0.79)
Asian/African origin	1.05	(0.60)	0.06	(0.25)	0.90	(1.47)
head's off-farm work	0.28	(1.63)	-0.02	(-0.76)	0.01	(0.12)
succession dummy	6.29	(2.43)*	0.12	(0.33)	1.16	(1.60)
exit dummy	***		0.48	(0.98)	0.15	(0.16)
number of observations	247		243		258	
R^2	5.0%		3.5%		4.3%	
probability of F	0.19		0.59		0.34	

Except for succession and exit dummies, all explanatory variables refer to base period. Observations include operative farms only.

* coefficient significant at the 5% level.

** coefficient significant at the 1% level.

*** variable excluded because of too few exits between 1971-1981.

The next step we want to take is to apply a regression analysis to examine the effect of succession on the growth of farms. We use the ratio of the total value added variables in two periods as the dependent variable, and initial period variables as explanatory variables. We also add dummy variables indicating whether the farm has been transferred to a succeeding child between the two periods, and whether the farm was sold outside the family. The results are reported in table 3. We have not used the 1975/6 data in this part of the analysis since value added in those years is not expressed in normative

terms. As the goodness-of-fit statistics show right away, there is not much to learn from the results. No explanatory variable was strongly significant. The succession and exit dummies have positive signs in all the regressions, but the only statistically significant effect on farm growth is that of succession between 1971 and 1981. This supports to some extent the findings described above (table 2).

Age profiles of farm size and intensity

We first want to look at the age profile of farm size. For this purpose, we group the observations from all the time periods and regress the natural logarithm of value added on personal characteristics of the farm operator. As mentioned before, value added is expressed in normative terms (except for 1975/6), and hence reflects the amount of land allocated to different crops and the number of livestock of different types. We also include several dummy variables of location, year, and village establishment year. Only operative farms are included. Obviously, we could have used the panel structure of the data to get more dependable estimates, but this is left for future research. The results are reported as model (1) in table 4.

Table 4. Regression results of value added levels

Variable	Model (1)		Model (2)	
	Estimate	t-value	Estimate	t-value
constant	0.67	(1.23)	-1.74	(-4.52)
old moshav	1.17	(6.13)**	0.37	(2.94)**
intermediate moshav	0.10	(0.66)	0.13	(1.27)
northern moshav	0.42	(3.43)**	-0.19	(-2.21)*
southern moshav	0.27	(2.47)*	-0.09	(-1.29)
mountain region	-0.08	(-0.72)	0.60	(6.71)**
Israeli native	0.30	(2.47)*	-0.02	(-0.24)
Asian/African origin	-0.43	(-4.47)**	-0.01	(-0.23)
1971 dummy	0.71	(5.92)**	0.24	(2.93)**
1981 dummy	0.81	(7.43)**	0.54	(7.51)**
1988 dummy	0.70	(5.72)**	0.73	(8.85)**
shadow of succession	-0.06	(-0.36)	-0.08	(-0.77)
age of household head	0.12	(5.64)**	0.02	(1.40)
(age squared)/100	-0.12	(-5.90)**	-0.03	(-1.85)
log(area cultivated)			0.26	(10.4)**
log(capital stock)			0.59	(18.6)**
log(labor input)			0.39	(11.5)**
number of observations		1258		1224
R^2		20.3%		59.8%

* coefficient significant at the 5% level.
** coefficient significant at the 1% level.

The results show that farms are larger in older relatively to younger moshavim, and in the northern and southern parts relative to the central part of the country. Farmers born in Israel tend to have larger farms, while those of Asian/African origin tend to have smaller farms. Farms are larger in 1971, 1981, and 1988, relatively to 1975/6. This, as mentioned before, probably reflects the different

definition of value added in 1975/6. We hypothesized that the shadow of succession (occurance of succession in a future time period) affects farm size positively, but it does not have any significant effect. Age, however, has the expected positive and then negative effect on farm size, and this effect is statistically significant. The coefficients imply that farm size reaches a maximum when the operator is 49 years old, which is about the sample mean.

Second, we want to hold farm size constant and examine the age profile of production intensity. If normative value added was calculated using land allocations only, adding total land holdings to the explanatory variables of the previous regression would have resulting in coefficients indicating what variables are associated with a crop mix that gives a higher value added for a given land size. Since in fact value added is determined by livestock as well, we also add the capital stock which includes the value of livestock. To complete the picture, a measure of farm labor input is also included. All three additional variables are transformed to natural logarithms.

This regression is reported as model (2) in table 4. All three additional variables have positive and significant coefficients. Production intensity exhibits a concave age profile again, but this time the concave effect of age is not statistically significant. Excluding the squared age variable, age itself has a significant negative effect. The shadow of succession does not have a significant effect on production intensity.

The coefficients of the other variables will be discussed while comparing them to the coefficients of the same variables in the size regression. Intensity is higher in older moshavim just as size is. This means that in older moshavim, not only do farms employ more means of production, they also use these means in relatively intensive activities. The regional effects, however, have opposite signs than the regional effects on farm size. Farms are larger in the north and south, but more intensive in the center. This is perhaps a consequence of the much higher demand for agricultural land in the central parts of the country. The mountain dummy have a significant positive effect on intensity, after having almost no effect on size. The absence of field crops, with relatively low value added per land, in mountain areas, could be the reason.

Summary

In this paper we have presented preliminary results on several issues related to farm succession, using a panel of Israeli family farms. We have compared farms that were transferred to children within a given period and farms that were not transferred. Between 1971 and 1975/6, succession contributed tremendously to farm expansion, both in terms of size and in terms of intensity. Expansion characterized farm transfers between 1975/6 and 1981, but it seems to have been concentrated in crops, while succeeding children exhibited a tendency to quit or at least reduce livestock operations. Expansion was not observed in farms experiencing intergenerational succession between 1981 and 1988, in part because successors tended to work quite a lot off the farm in that period.

We have also looked at how farm size and intensity of production change with the age of the farm operator. We found that farm size has the expected hump-shaped age profile, with farm size rises up to age 49 and then declines. Production intensity seems to decline with the age of the operator, with

no significant concave effect. We could not identify a "shadow of succession" effect, where farms start expanding in expectation of future succession. Several regional differences in size and intensity were also found among the farms in the sample. Since normative value added, which was used to proxy for size, was calculated on a regional basis, one has to be careful when interpreting these differences.

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