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LOCAL ENTREPRENEURS CONTRIBUTIONS TO THE ECONOMIC BASE: HARDWOOD PROCESSORS IN THE NORTHERN AND CENTRAL APPALACHIAN REGION.

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ABSTRACT: *Economic development efforts at state and local levels are increasingly focusing on supporting local entrepreneurs, and more recently the focus has begun to include the local natural resource base. The ten states in the Northern and Central Appalachian region are ideally suited for this policy, as they have a large reserve of high quality hardwoods and encompass major metropolitan markets. The purpose of this paper is to examine the role of locally owned and operated hardwood processing businesses in creating employment opportunities and contributing to the economic base of the state and communities in which they are located, and to determine the entrepreneurial characteristics related to these activities. The study is based on a mail survey of 202 businesses.*

INTRODUCTION

Two bases of economic development have been receiving renewed attention in recent years. One is small business and entrepreneurship. The second is the local natural resource base. For many rural areas, a combination of the two may provide promise. Beginning in the late 1970's, researchers consistently linked entrepreneurship with economic development. The focus was shifted to small business by Birch (1979), who claimed that 66 percent of the total jobs generated between 1960 and 1975 were in firms of 20 or fewer employees. More than 98 percent of America's businesses are small (less than 100 employees), but in rural America they are the very lifeblood (Abdnor 1988). Overall, small business accounted for 94 percent of rural employment growth from 1980-1986. In rural areas, businesses with fewer than 20 employees were responsible for about two-thirds of rural job growth. The net increase in jobs in non-metropolitan areas between 1980-1986 was 62.7 percent for firms with fewer than 20 employees (Abdnor 1988). Many other studies have substantiated these earlier findings, indicating that small businesses generate a disproportionate share of the new jobs created, and inject a source of innovation into rural economies (Green 1994).

The renewed focus on the local natural resource base followed the precipitous decline in rural manufacturing in the 1980s. Manufacturing had been the basis of rural employment growth in the 1960s and 1970s, but was the major source of employment declines in the 1980s. Services employment replaced job losses in manufacturing in the aggregate, but the higher-paying, economic-base services were concentrating in and around metropolitan areas. Thus, many states and communities began to look again at their natural resource as a more sustainable and long run basis for their economies.

The most common natural resource in the Northeastern United States is the forests. The forests of the Northern and Central Appalachian region contain the largest storehouse of quality hardwood timber[1] of any region in the country -- 29 percent of the United States' total hardwood growing stock (Waddle et al. 1989). Luppold (1989) estimated that between 1965 and 1987, total United States hardwood lumber output increased by 18 percent, with production in the Northeastern and North Central regions increasing by 34 and 46 percent, respectively. Access to these wood raw materials was found by Bodenman et al. (1996) to be an important locational criterion for hardwood manufacturers in the region.

Thus, the combination of small business and hardwood resource utilization may provide promise for economic development in the region. If this is to be a

policy focus, information is needed on these entrepreneurs to properly assess their potential contribution. One key contribution is the role in the economic base -- exports.[2] A second is employment generation. How much is created, and do small businesses increase employment over time?

The overall goal of this study is to identify factors, and important relationships between factors, that influence the exports and employment expansion of small entrepreneurships in the hardwood manufacturing industry. The specific objectives of this study are to: (1) examine the characteristics of locally owned and operated hardwood manufacturing entrepreneurs, and (2) determine the characteristics of the entrepreneurs and their businesses that relate to higher out-of-state export levels and employment expansion.

DATA AND METHODOLOGY

The data were gathered by a mail survey from businesses in the 10-state Northern and Central Appalachian Region in May and June, 1992. States in the study region include: Connecticut, Maryland, Massachusetts, New Hampshire, New York, Ohio, Pennsylvania, Vermont, Virginia, and West Virginia. The current sample was selected from the 642 firms studied by Bodenman (1991), who sampled all hardwood processing industries in those states. Two general industry groups were selected for the original study--lumber and wood products (SIC 24) and furniture and fixtures (SIC 25). The criteria for this follow-up study were that at least 90 percent of each firm must be owned by county residents, and that the firms had to be a single unit establishments. From the 642 firms, 325 were found to fit that description. The criteria that the firm must be at least 90 percent locally owned was imposed because the sample was not large enough to require 100 percent (too many firms were lost). In addition, there was little difference between the number of firms that were 75 percent locally owned and those that were 90 percent locally owned.

Nineteen (6%) of the 325 questionnaires were returned undeliverable. Eleven of those were returned because the address was invalid. The remaining 8 were returned because the business had been abolished or the owner was deceased, thus reducing the sample from 325 to 306. The total usable response was 202 surveys, representing a response rate of 66 percent.

DESCRIPTIVE RESULTS

One important contribution entrepreneurs make to the long run growth of local economies is expanding employment opportunities. Expansion was measured by whether or not the businesses expanded employment since 1980. This includes businesses started after 1980, which may or may not have been more likely to expand because of less time in existence. Out of the 202 responses to this question, only 66 (33 percent) had not expanded since 1980, and 136 (67 percent) had expanded. In metro counties, 62 percent of the establishments expanded since 1980, versus 73 percent in non-metro counties.

Current employment size appears to be related to recent expansion. Among the smallest businesses (0-9 employees), the sample is split 50 percent which did not expand and 50 percent which did expand. As size increases a difference can be seen. For the businesses that had 10-20 employees in 1990, 74 percent expanded, and 26 percent did not. Among the largest size businesses (21-99 employees), 89 percent had expanded since 1980.

Valuable policy information is the personal or community attributes that encourage expansion. Higher education is a characteristic commonly associated with successful entrepreneurs. In relationship to expansion, the results showed that the owners who did not expand, 61 percent had a high school degree or less, while only 39 percent with a higher education did not expand. Of those that did expand, 42 percent had a high school degree or less and 58 percent had more than a high school degree. Thus, those owners who had a higher level of education had a higher likelihood of expanding. The chi-square statistic for this crosstabulation was significant at the .01 level.

Another personal attribute is previous experience in the industry. The hypothesis is that the firm would be more likely to expand if the owner had previous experience in the wood industry. The reason is that the individual would be more aware of opportunities and understand the industry better than someone who previously worked in another industry. The results show that this assumption did not hold. Of those who had previously worked in the wood industry 64.8 percent had expanded, but of those who had not previously been employed in the wood industry, 72.9 percent had expanded. Thus, there was only a slight and not statistically significant difference, but with higher

percentage expanding that were not previously employed in the wood industry.

A second contribution to local economies is industries that export in order to generate additional employment and income. Exports are measured here by percent of total sales exported out of state. Admittedly, the state may not be the most appropriate unit from which to measure exports. Theoretically, defining some 'functional economic area' from which to measure exports might be preferable. However, functional economic areas are not likely to be identified with a particular political or administrative unit. Because the majority of development organizations and initiatives to encourage forest-based economic development are organized and administered at the state level (Bodenman et al. 1996), the state is considered the more useful unit of analysis for the purposes of this paper.

Businesses that exported more than 50 percent of their products out of the state are considered to be primarily export oriented businesses, 39 percent were from metro counties and 61 percent were from non-metro counties. Of the firms which were not export oriented (exported 50 percent or less outside the state), 56.4 percent were from metro counties and 43.6 percent were from non-metro counties.

Size often has been used to explain export orientation. It is usually assumed that the larger the firm the more contacts that are likely established, resulting in more sales from larger distances. In this sample, of those that exported more than 50 percent outside of their state, half were in the largest category (21-99 employees), although this category makes up only about one-quarter of the sample, while 25 percent each was in the smallest (0-9 employees) and middle (10-20 employees) categories. Of those that exported 50 percent or less outside the state, 56.8 percent were in the smallest category, while 25.9 percent were in the 10-20 size, and only 17.3 percent were in the largest size category. These comparisons are statistically significant at the .001 level.

The relationship of these and other variables to firm exporting activity will be examined in greater detail by regression analysis in the next section.

THE MODEL

The percentage of a firm's total sales which are exported out-of-state was hypothesized to be a function of eleven entrepreneurial/firm characteristics (Table 1).

Table 1. Eleven entrepeneur/firm characteristics

$Y_i = f$(STARTUP, SIZE, Non-metro, PRINPROD, SCHOOL, COMMTIES, PRIORJOB, INDIVID, WOODEMP, FORMAL, AGEBUS);

where:

STARTUP	=	how the business was acquired (bought from a family member, bought from a nonfamily member, or self started;
SIZE	=	number of employees in 1990;
NON-METRO	=	location of firm in a metro (0) or non-metro (1) county;
PRINPROD	=	the firm's principal product (grouped by SIC codes into low value-added (0) and high value-added (1) categories;
SCHOOL	=	level of education, grouped as high school degree or less (0) and higher education (some college, college degree, some grad education) (1);
COMMTIES	=	a) community ties to the area, before locating there (1) (lived there, grew up there, went to school there, vacationed there, worked there, retired there, or had relatives there), and no ties (1); and b) variable also constructed as strong ties (lived or grew up in area), weak ties (vacationed, worked, went to school, retired, or had relatives in the area prior to locating there), and no ties to area (1);
PRIORJOB	=	previous position at last place of employment (owner/manager, sales/clerical, technical/engineering, or skilled/unskilled labor);
WOODEMP	=	previous experience in wood industry (1), no (0);
TRAIN	=	formal training in the wood industry (1), no (0);
INDIVID	=	percent sales to individuals;
AGEBUS	=	a) age of the business; and b) year that the business started measured by (0) prior to 1970, (1) between 1970-79, or (3) started between 1980-89.

Table 2. Independent variables: Description and percent

DESCRIPTION	Percent
Startup: business purchased from family member (FAMILY)	31.6%
Startup: business purchased from nonfamily (NONFAM)	15.3%
Startup: business self started (SELF)	53.1%
Size: 0-9 employees (SMALL)	48.0%
Size: 10-20 employees (MEDSM)	25.3%
Size: 21-99 employees (MED)	26.8%
Metropolitan status: Metro (Non-metro)	52.0%
Metropolitan status: Non-metro (Non-metro)	48.0%
Principal product produced: low value-added (PRINPROD)	55.4%
Principal product produced: high value-added (PRINPROD)	44.6%
School: high school or less (SCHOOL)	48.7%
School: more than high school (SCHOOL)	51.3%
Community ties: ties to the community (COMMTIES)	78.2%
Community ties: no ties to the community (COMMTIES)	21.8%
Prior job: owner/manager (OWNER)	45.5%
Prior job: technical/engineer (TECH)	7.2%
Prior job: sales/clerical (SALES)	11.4%
Prior job: skilled/unskilled (LABOR)	35.9%
Had previous wood employment (WOODEMP)	42.6%
Had formal training in wood processing (TRAIN)	71.8%
More than 50% of sales to individuals (INDIVID)	18.6%
Year business started: 1970-79	26.2%
Year business started: 1980-89	12.9%

These variables are specifically defined as follows (see Table 2 for a summary of the variables):

1) **How the business was acquired** (STARTUP) is a variable that describes the type of entrepreneur. The entrepreneurs in this survey had either purchased the firm from a family member or inherited it, purchased the firm from a nonfamily member, or started the business themselves. Because "pure entrepreneurs" (started the business) initially take the largest risk to start the business, previous studies (Cavsgil 1984; Case 1990) indicate that they would also be more likely to take the risk of expanding and seeking out more distant markets.

2) **Employment in 1990** (SIZE) was chosen as a proxy for size of firm. Previous studies (Culpan 1989; Saimee and Walters 1990) indicate that larger businesses are more likely to have greater market access than smaller firms, and thus are likely to export a higher percentage of there sales out of state.

3) **Previous position** (PRIORJOB) was chosen to identify the individual's position at their last job, and is a proxy for experience. Wilken (1989) indicates that entrepreneurs who were owners/managers at their last place of employment can be expected to positively influence business expansion and exports more than those with other job experience. This is expected because owners/managers have contacts and business experience that helps them to line up future customers, and/or to understand the export market possibilities.

4) **Community ties** (COMMTIES) was chosen to examine whether or not individuals without ties are more willing to take a risk in an unknown area, versus those that do have local ties. Green (1994) found that entrepreneurs with local ties are also likely to be local-market oriented. Therefore, entrepreneurs without ties to a community might have ties to other states, and thus be more likely to see an opportunity for exporting than those with ties to the community.

5) **Non-metropolitan status** (Non-metro) indicates whether the firm is currently located in a non-metropolitan county or not. Bodenman et al. (1996) found that non-metro businesses might not be as well informed about the market as metro businesses, thus giving non-metro businesses less of an opportunity to expand and export.

6) **Education** (SCHOOL) is a proxy for level of knowledge and experience. Based on the findings in

previous studies by Reid (1991) and Posner (1986), the hypothesis is that the higher level of education an entrepreneur has received, the more likely the establishment will be to expand and increase exports.

7) **Level of value-added processing** (PRINPROD) identifies the firm's principal product by four digit SIC (refer to Table 2). Those firms with SIC codes 2421, 2426, 2431, 2441, 2448, and 1449 are considered lower value-added, and firms with SIC codes 2429, 2435, 2439, 2452, 2434, 2499, 2511, 2521, 2531, and 2541 are considered higher value-added. The hypothesis is that the higher value-added products will be exported more than the lower value-added products.

8) **Previous employment in the wood industry** (WOODEMP) prior to starting or acquiring the business, another proxy for experience, is hypothesized to increase expansion and exports. The hypothesis is based on the earlier findings by Case (1990) and Malizia (1985) that prior experience starting a business, and working in the same industry were positively and statistically significantly related to growing a new business.

9) **Formal training** (TRAIN) indicates if the entrepreneur had formal training in wood processing or not. The hypothesis is that those entrepreneurs that did have formal training are more likely to have expanded exports since 1980. The hypothesis is based on the findings of Reid (1981) that an individual with formal training in a particular industry will be better prepared to run a business and export.

10) **Percent sales to individuals** (INDIVID) measures the percentage of sales made to individuals (i.e., sales of consumer goods, versus intermediate goods—sales to other businesses). Based on the findings of Carloff (1994), the hypothesis is that entrepreneurs with a major percentage of sales to individuals have more necessity to export.

11) **When was the business established** (AGEBUS) measures the year that the entrepreneur either purchased or started the business. Some of the businesses in this sample have been around since 1801, thus to derive the age of the business, the year that the business started was subtracted by the year the survey was administered (1992). The variable is then used as a continuous variable, with the assumption that the older the business the more likely that business would export out of state. This assumption is backed by the findings of Cavsgil (1984) that the older businesses have more connections and more access to markets. This same variable was also categorized into three groups in order for a more detailed analysis. The three groups were prior to 1970, 1970-79, and 1980-89. With these categories the assumption is that the older business (prior to 1970) would most likely have the highest exports.

The model is estimated with a two-limit tobit procedure (Maddala 1983). The model underlying tobit is expressed as follows:

$$\begin{aligned} &0, \text{ if } \beta X_i + \varepsilon_i \le 0 \\ Y_i &= \beta X_i + \varepsilon_i, \quad \text{if } 0 < \beta X_i + \varepsilon_i < 100 \\ &100, \text{ if } \beta X_i + \varepsilon_i \ge 100, \end{aligned}$$

where 0 and 100 are the lower and upper limits on the dependent variable Y_i, β the vector of coefficients, X_i the vector of independent variables, and ε_i, the independently normally distributed error with zero mean and constant variance σ^2. The model assumes that $\beta X_i + \varepsilon_i$ is a latent variable, observed only when it falls between the limits.

The tobit procedure is more appropriate than an OLS estimation, as the dependent variable is a percentage with limits at 0 and 100, thus giving a censored regression. Estimation with OLS leads to biased and inefficient estimators when a number of values of the dependent variable are at the limits (32 percent of the dependent variable values are either zero or 100).

REGRESSION RESULTS

The tobit analysis results are reported in Table 3. The tobit models vary in different measures of community ties, and in the different measures of year that the business started. Models 1 and 2 measure community ties as ties or no ties, where Models 3 and 4 measure community ties in terms of strong ties, weak ties, or no ties. However, this variable was not found to be statistically significant in any one of the four models.

The other change between models was the way in which the age of business was measured. In Models 1 and 3, the year that the business started was measured in a continuous form of how old the business was (age). In Models 2 and 4, however, the year that the business started was measured in terms categories, where businesses that started prior to 1970 were used as the base comparison. Age of the business did not appear to be statistically significant in Models 1 and 3. However, in Models 2 and 4 the group of businesses starting between 1970 and 1979 were statistically significant to exporting. In general, those businesses starting within

Table 3. Tobit Models for Exports.

VARIABLES	MODEL 1	MODEL 2	MODEL 3	MODEL 4
INTERCEPT	28.270 .18795	36.612 .06819*	24.123 .26835	33.314 .09747*
HOW BEGAN: FAMILY	-9.2162 .44740	-8.9356 .45331	-12.586 .29116	-11.575 .32079
SELF	-7.0410 .52331	-76224 .47313	-10.480 .33519	-10.949 .29624
EMPLOYMENT 1990	.27569 .01759**	.24917 .02889**	.26101 .02502**	.23186 .04165**
NONMETRO OR NOT	22.096 .00269***	24.058 .00110***	24.115 .00105***	25.723 .00048***
HIGH VALUE ADDED OR NOT	.90406 .60576	.97175 .57381	1.4477 .41118	1.4429 .40691
HIGHER EDUCATION OR NOT	3.4221 .67153	4.2754 .59203	2.0810 .79735	3.1844 .69162
COMMUNITY TIES OR NOT			.45576 .62051	.56132 .94236
COMMUNITY TIES: STRONG	-4.7442 .59572	-5.2451 .55088		
WEAK	11.184 .45240	7.3114 .62187		
PRIOR JOB: SALES	-1.9740 .89756	-5.7407 .70544	-6.6259 .66941	-9.6213 .53143
OWNER	-3.0240 .81306	-6.4884 .60531	-4.9066 .70415	-7.3323 .56304
LABOR	-7.9704 .55823	-11.969 .37675	-10.859 .42466	-13.445 .32122
MORE THAN 50% SALES TO INDIVIDUALS	-.42387 .00042***	-.42321 .00036***	-.41980 .00048***	-.41883 .00042***
FORMAL TRAINING OR NOT	5.5404 .51433	4.5258 .58729	8.7525 .30573	7.3369 .38226
PRIOR WOOD EXPERIENCE OR NOT	-15.767 .04209**	-15.795 .03891**	-16.848 .03232**	-16.542 .03311**
AGE OF BUSINESS	.57175 .79499		.51449 .81436	
YEAR STARTED: 1970-79		-17.951 .05594*		-17.256 .06715*
1980-89		2.8937 .74310		3.1128 .72283
NUMBER OF OBSERVATIONS	161	161	157	157
PSEUDO R^2	.207	.225	.206	.222
CHI SQUARE	42.06***	46.70***	40.70***	44.86***

Significance levels: ***0.01; **0.05; *0.10.

the time 1970-79 are less likely to export more than 50 percent of total sales out of the state than those businesses either starting prior to that decade or after that decade.

Another variable that was statistically significant in all four of the models was the size of firm. The size was measured by the number of employees as of 1990. This variable was statistically significant to exporting, and positively related to the likelihood of exporting. In general, the larger the firm, the more likely that firm is to export sales out of the state.

A firms locational setting, metro county or non-metro county, also was statistically significant to increases in exports. In general, if the firm was located in a non-metro county it was more likely to export out of the state then if the firm was located in a metro county. An explanation of this is that in non-metro counties there might be fewer markets to sell in to, thus, encouraging the entrepreneur to reach out to other areas to sell their products.

Another variable that was found to be statistically significant in all four models was percent sales to individuals. Table 3 indicates that businesses who sell more than 50 percent of their total sales to individuals are more likely to export out of state than those that sell less than 50 percent to individual customers.

The final variable found to be statistically significant in all four models was previous wood experience. This characteristic of the entrepreneur measured experience in the wood industry prior to acquiring the business. Interestingly, wood industry employment was negatively associated with exports. That is, if an entrepreneur had previously worked in the wood industry then he or she was less likely to export than entrepreneurs whom did not have prior experience in the wood industry.

SUMMARY AND CONCLUSIONS

The purpose of this paper was to examine the role of locally owned and operated hardwood processing businesses in creating employment opportunities and contributing to the economic base of the communities in which they are located, and to determine the entrepreneurial characteristics related to these activities. The results showed that these businesses contribute substantially to both employment creation and the economic base. Two-thirds of the businesses had expanded employment since 1980, with almost three-fourths of the non-metro businesses expanding. Also, almost 30 percent of the businesses exported over half of their sales out of state, and over 60 percent of these were located in non-metro counties.

The entrepreneurial characteristics related to employment expansion were how the business was acquired, education of the owner, age of owner when the business was acquired or started, and current size of business. Contrary to expectations, self-started businesses were less likely to have expanded than were those acquired from family or nonfamily. This may be because the self-started businesses generally were newer and smaller, and were more concerned about establishing themselves. The owner's level of formal education, and the size of the business, were also positively related to employment expansion. Age of owner was negatively related. These results support previous research on other types of entrepreneurs.

The characteristics of entrepreneurs that most influenced exports were current size, location in a non-metropolitan county, type of market, and previous employment in the wood industry. All except current size and non-metropolitan location were negatively related to exports. That is, larger, already existing, non-metropolitan businesses were more likely to be export oriented. Entrepreneurs who had not had previous experience in the wood industry also were more likely to export. Those less likely to export were more locally oriented through community ties, but relied less on sales to individuals. It appears that those with less exposure to other influences are thus less likely to explore nonlocal markets. Also, whether or not the product was of higher value added did not influence exports. Thus, rural entrepreneurs, through their location or type of product, are not *a priori* at a disadvantage in exporting out of state.

State and local development efforts to encourage hardwood processing entrepreneurs appear likely to generate positive economic results. To improve the chances for these outcomes, the analysis in this study showed that maintaining a strong education base is necessary, and that technical and adult programs would also be beneficial. In addition, as self-started businesses (as opposed to existing enterprises acquired from someone else) were less likely to export out of state and to have expanded employment, particular efforts might be directed to these entrepreneurs. Legitimate public or public-private programs would be to improve access to and information about expanded market opportunities.

ENDNOTES

[1]The predominant hardwood species in the study region are red oak, black cherry, white ash, hard maple, and yellow poplar.

[2]The basis of many natural resource based economic development programs is export base theory. The central idea of export base theory is that regional income is determined by the regions "basic" or export activities (i.e., sales of goods and services outside the state). All other economic activity, labeled "non-basic", serves the local market (i.e. in-state demand) and is purported to exist as a consequence of the income generated from "basic" activities (Lesage and Reed 1989). Therefore, within the context of export base theory, exports and the industries that generate them are viewed as the engine that drives an economy (Webster et al. 1990; Archer and Maser 1989; Posner 1984).

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