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## Gender differences in determinants of entrepreneurial intentions in a rural setting

### Abstract

A number of studies reported that in an urban setting the share of women in total entrepreneurial activity still lags behind the share of women in the labor force, and that female entrepreneurship may be influenced by different factors than male entrepreneurship. This paper investigates whether males and females are influenced by different factors when making a decision to start new businesses in a rural setting in the post Tobacco Buyout era. The analysis is based on the unique dataset collected during the ongoing natural experiment in the Appalachian region in U.S. The data support the hypothesis that females, but not males, are “pushed” into entrepreneurial activities by changing economic environments and lack of household income. The analysis also illustrates that the family structure and internal family events, such as death of a household member or divorce, strongly influence the decision to start a new business, and that these effects vary by gender.

**Keywords:** entrepreneurial intentions, gender differences, rural entrepreneurship.

### Introduction

In November 2004 the U.S. Congress passed legislation eliminating the tobacco program. This action had forced major reorganization of the Kentucky economy. The Commonwealth of Kentucky, being the most tobacco-dependent state of the U.S. (according to NASS (2001) 17 of the 20 most tobacco-dependent counties in the U.S. are in Kentucky), is particularly vulnerable to changes in the tobacco economy. Entrepreneurship may offer a viable alternative to industrial recruitment as a sustainable development strategy, especially in rural areas coping with a loss of tobacco income. Consequently, the state strongly encourages and supports development of entrepreneurship in rural Kentucky. However, to design a successful support system for nascent and established entrepreneurs in rural areas, it is important to understand what the major determinants of entrepreneurial intentions and activities are.

The existing entrepreneurial literature emphasizes high technology innovations, large-scale startups fueled by venture capital, and self-reinforcing clusters that reap the economies of agglomeration. Rural entrepreneurial ventures are less likely to be high-tech, highly capitalized, or geographically concentrated. Many may employ only a few people, and many may be part-time operations. If it is true that the features and drivers of rural entrepreneurship differ from those of urban entrepreneurship, then many open questions remain about the potential contribution of entrepreneurship to rural economic development.

Literature focused on rural entrepreneurship still remains limited (e.g., Acs and Malecki, 2004; Fuller-Love, Midmore, Thomas, Henley, 2006). Most studies were conducted using datasets based

on samples of established entrepreneurs. The Panel Study of Entrepreneurial Dynamics (PSED) is a unique database of nascent entrepreneurs who were in the process of starting companies, but it mostly covers an urban sample. Therefore a large hole exists in the literature on determinants of entrepreneurial intentions in a rural setting.

Results of the analyses based on the urban datasets suggest a number of important factors that are correlated with entrepreneurial intentions. In particular, many studies reported significant gender differences in both rates and determinants of entrepreneurial activities (e.g., Reynhold et al., 2002). The goal of this paper is to investigate what factors significantly correlate with entrepreneurial intentions in a rural setting in the post Tobacco Buyout era, and whether these factors differ across genders.

The paper is built as follows. First the literature about the gender effect on the formation of entrepreneurial intentions is reviewed and hypotheses are formulated. Then the dataset is described and the sample limitations are evaluated. Finally, the results of the analysis are presented and discussed.

### 1. Entrepreneurial intentions and gender differences

Literature reported a number of determinants of entrepreneurial activities. Some of these determinants affected females differently than males. In this section some of the determinants are reviewed.

**1.1. Economic factors.** *1.1.1. Necessity entrepreneurship – Push hypothesis of entrepreneurship.* Two general hypotheses for entering entrepreneurship were offered in the literature: “pull” hypothesis and “push” hypothesis (Shapero and Sokol, 1982). Unemployment, fear of job loss, or dissatisfaction with the entrepreneur's previous job are considered

main “push” motives for entering entrepreneurship (Brockhaus, 1980; Cromie & Hayes, 1991), while the potential for increased life satisfaction was considered as a main “pull” motive for individuals to pursue an entrepreneurial career (e.g., Schjoedt and Shaver, 2004).

In particular, income disparity (Verheul et al., 2002; Ilmakunnas et al., 1999), and unemployment level (Audretsch et al., 2001) were shown to be “push” factors influencing entrepreneurship. Several studies reported that a “push” effect is stronger for females than for males, especially in the transition economies (Lauxen-Ulbrich and Leicht, 2002; Sternberg, Bergmann, and Luckgen, 2004).

The Commonwealth of Kentucky, being the most tobacco-dependent state of the US, is particularly vulnerable to changes in the tobacco economy. A large number of tobacco farmers now have to adjust to the new economic conditions and are likely to experience decrease of income. It might be argued that a number of former tobacco farmers might be pushed toward the entrepreneurial activities by changes in the local economy. If a “push” effect is stronger for females than for males, than higher rates of entrepreneurship might be observed among females than among males.

*1.1.2. Industry structure.* Women are less likely than men to operate businesses in high technology sectors (Loscocco and Robinson, 1991; Anna et al., 1999), but are over represented in the service sector (Oppenheimer, 1970; Ward and Pampel, 1985). Consequently, it was argued that technological development influences male entrepreneurship stronger than female entrepreneurship, while growth of the service sector affects female entrepreneurship stronger than male entrepreneurship (Verheul, Stel, and Thurik, 2004). Rural entrepreneurial ventures are less likely to be high-tech, highly capitalized, or geographically concentrated. Many of them are service oriented, aimed to provide services otherwise available only in urban areas. Consequently, relatively high entrepreneurial rates among females might be observed in the rural setting.

**1.2. Demographic factors.** Demographic factors, such as age, education level, marital status, and ethnicity are repeatedly reported to strongly correlate with self-employment (Cooper and Dunkelberg, 1987; Evans and Leighton, 1989; Delmar and Davidsson, 2000; Reynhold, 1997).

*1.2.1. Age structure.* The rates of nascent entrepreneurship were reported to be highest in the age category of 25 to 34 years old (Storey, 1994; Reynolds et al., 1999). However, this result might not be applicable to female entrepreneurship. Women are

more likely to withdraw from employment when they reach the child-rearing age (Charles et al., 2001), and return to employment later, when their children grow up. Consequently, while more individuals within age group 25 to 34 tend to be entrepreneurs, there might be more male entrepreneurs within this age group and less female entrepreneurs.

*1.2.2. Education level.* Prior research indicates that educational level strongly correlates with self-employment for both males and females (Robinson and Sexton, 1994; Delmar and Davidson, 2000; Kovalainen et al., 2002). In general, the educational level of women is a strong predictive factor of female participation in the labor market. In general, it was suggested that a higher level of women integration in the economy positively correlates with a higher level of female self-employment. However, in the rural economies the effect of education might be different. A number of employment opportunities are significantly lower in the rural settings compared to the urban settings. Females with lower education levels are less likely to be considered competitive in the limited labor markets, and, hence have fewer alternatives to self-employment.

*1.2.3. Family structure.* The family structure strongly affects a decision of an individual to choose self-employment over a wage employment, for example, the head of household who is responsible for maintaining the family is more likely to prefer activities that involve fewer risks (OECD, 2001). Moreover, a family structure affects males and females differently. For example, the presence of children influences the employment rates of men and women in opposite directions (OECD, 2002). As it was mentioned above, women are more likely to withdraw from employment when they reach the child-rearing age. Mothers are less likely to be full-time employed than women without children, since females are more likely to be the “primary parent, emotional nurturer and housekeeper” (Unger and Crawford, 1992, p. 474). Overall, females are more likely affected than males to be affected by the family structure and events that influence regular family routine.

**1.3. Personal characteristics.** *1.3.1. Entrepreneurial self-efficacy.* Among personal characteristics strongly correlated with the entrepreneurial intentions, entrepreneurial self-efficacy (ESE) has been reported to be the most consistent predictor (Chen et al., 1998; DeNoble et al., 1999; DeNoble et al., 2007). Self-efficacy is a self-perception of the individual skills and abilities in the specific domain (Bandura, 1989). Consequently, entrepre-

neurial self-efficacy is an individual’s belief that he/she can successfully solve all problems associated with starting a new business.

Wilson, Kickul and Marlina (2004, 2007) reported that the effect of entrepreneurial self-efficacy on entrepreneurial intentions varies by gender, being stronger for females than for males. However, if females in the rural setting are more likely than males to be “pushed” into entrepreneurial activities by lack of income or fear of job loss, then the effect of entrepreneurial self-efficacy on entrepreneurial intentions for them is likely to be weaker than for males.

**2. Hypotheses and regressors**

Based on the results reported by the prior studies a number of hypotheses that describe the most important factors explaining gender differences in rural entrepreneurship were formulated.

**2.1. Economic factors.**

- ◆ Necessity entrepreneurship – Push hypothesis of entrepreneurship

*H1: Low income and changes in the local economy can “push” individuals into starting new businesses.*

*H1a: Females are more likely than males to be “pushed” into starting new businesses by the changes in the local economy.*

*H1b: Females are more likely than males to be “pushed” into starting new businesses by low income.*

- ◆ Industry structure

*H2: Females are more likely than males to start new businesses in the service sector.*

**2.2. Demographic factors.**

- ◆ Age structure

*H3: Age is strongly correlated with entrepreneurial intentions.*

*H3a: Correlations between age and entrepreneurial intentions are gender specific.*

- ◆ Education

*H4: Education level significantly correlates with entrepreneurial intentions.*

*H4a: Correlations between education level and entrepreneurial intentions are gender specific.*

- ◆ Family structure

*H5: A family structure significantly affects entrepreneurial intentions.*

*H5a: Females are more likely than males to be influenced by the family structure, and by events that interrupt the regular family routine when they consider starting new businesses.*

**2.3. Personal factors.**

- ◆ Entrepreneurial self-efficacy

*H6: Entrepreneurial self-efficacy significantly correlates with the entrepreneurial intentions.*

*H6a: Entrepreneurial self-efficacy is a stronger predictor of entrepreneurial intentions for males than for females.*

**2.4. Regressors.** The logistic regression was employed to test the above hypotheses. The dependent variable, entrepreneurial intentions, was measured by asking all respondents the question “Are you planning to start a new business?” (1 = Yes, 0 = No). Table 1 presents a list of independent variables.

Table 1. List of the dependent and independent variables

Variables	Survey questions	Coding
Planning	Are you planning to start a new business?	1, if yes, 0 o/w
Quit tobacco	Have you raised tobacco during last three years?	1, if had grown tobacco in the past three years, but does not plan to grow tobacco in the future, 0 o/w
	Do you plan to grow tobacco in the future?	
Unemployed	What is your employment status?	1, if unemployed, 0 o/w
Spouse unemployed	What is your spouse employment status?	1, if spouse is unemployed, 0 o/w
What is your household income?		
Income 1	Less than \$29,999	1, if yes, 0 o/w
Income 2	\$30,000-\$79,999	1, if yes, 0 o/w
Income 3	\$80,000-\$119,999	1, if yes, 0 o/w
Income 4	More than \$120,000	1, if yes, 0 o/w
Age 1	What is your age?	1, if <35, 0 o/w
Age 2		1, if 35-54, 0 o/w
Age 3		1, if 55-64, 0 o/w
Age 4		1, if > 64, 0 o/w
Gender	What is your gender?	1, if female, 0, if male.

Table 1 (cont.). List of the dependent and independent variables

Ethnicity	What is your ethnicity?	1, if white, 0 o/w
Marital status	What is your marital status?	1, if married, 0 o/w
Education	What is your level of education?	1, if no high school education; 2, if high school education; 3, if college education; 4, if graduate education.
Children	How many children younger than 18 years old do you have as a part of your household?	Number of children
Death	Have you experienced death in your household within last three years?	1, if yes, 0 o/w
Divorce	Have you experienced divorced within last three years?	1, if yes, 0 o/w
Community	How would you describe your community?	1, if rural, 0 o/w
Starter self-efficacy	See Table 2	Index between 1 and 5.

Independent variables included economic factors, demographic factors and personal factors. Economic factors included low income, decision to quite tobacco production, being unemployed and spouse being unemployed. Demographic factors included age, ethnicity, marital status, education, number of children in the household, residence in the rural community, and interruption in the regular family routine, such as death in a household or divorce within last three years. Personal characteristics included entrepreneurial self-efficacy. This variable is discussed in greater details below.

Several entrepreneurial self-efficacy scales were suggested in the literature. Chen, et al (1998) identified five entrepreneurial roles: marketing, innovation, management, risk-taking, and financial control, which he used to develop a domain specific measure of entrepreneurial self-efficacy. However these domains were chosen based on existing literature on urban entrepreneurship and interviews with urban entrepreneurs; to be applicable to a rural setting they need to be modified.

In this paper a focus in is on rural *starters* (Vesper, 1999), individuals who enter an independent business by creating either a new one (*founders*) or a franchise firm (*franchisees*) in a rural setting. Verhaul et al (2005) suggested that *founders* and *franchisees* widely differ with respect to innovating and risk taking. Consequently, questions related to the risk taking and innovating were not included in the entrepreneurial self-efficacy scale SE scale, and only questions related to financial, management, marketing and production problems associated with starting a new business were included.

All respondents were asked 11 questions about their level of confidence regarding their ability to solve problems usually associated with starting a new business and 2 questions about their overall level of confidence in their ability to start a new business (see Table 2). Respondents provided the answers using 5 item self-assessment scale. Based on the respondents' answers a self-efficacy scale was created.

Table 2. Questions used to evaluate an entrepreneurial self-efficacy

Questions	Coding				
	1	2	3	4	5
How certain are you that if you start a new business you will be able to					
1. Obtain a bank financing	highly uncertain	uncertain	neutral	certain	highly certain
2. Obtain venture capital financing	highly uncertain	uncertain	neutral	certain	highly certain
3. Obtain start-up capital	highly uncertain	uncertain	neutral	certain	highly certain
4. Obtain working capital	highly uncertain	uncertain	neutral	certain	highly certain
5. Obtain raw materials	highly uncertain	uncertain	neutral	certain	highly certain
6. Attract employees	highly uncertain	uncertain	neutral	certain	highly certain
7. Deal with distributors	highly uncertain	uncertain	neutral	certain	highly certain
8. Attract customers	highly uncertain	uncertain	neutral	certain	highly certain
9. Compete with other businesses	highly uncertain	uncertain	neutral	certain	highly certain
10. Comply with local, state & federal regulations	highly uncertain	uncertain	neutral	certain	highly certain
11. Keep up with technological advances	highly uncertain	uncertain	neutral	certain	highly certain
Indicate how strongly you agree or disagree with the following statements					
12. If I work hard, I can successfully start a new business	strongly disagree	disagree	neutral	agree	strongly agree
13. I am confident I can put in the effort needed to start a business	strongly disagree	disagree	neutral	agree	strongly agree

The individual score for the entrepreneurial self-efficacy was derived by summing the items and dividing by the number of items in the scale.

### 3. Dataset and sample limitations

The Tobacco Transition Payment Program (TTPP), also called the “tobacco buy-out”, was designed to help tobacco quota holders and producers make the transition from the Depression-era tobacco quota program to the free market. The Fair and Equitable Tobacco Reform Act of 2004 (P.L. 108-357), signed by President Bush on Oct. 22, 2004, provides annual transitional payments for 10 years to eligible tobacco quota holders and producers. According to NASS (2001), 17 of the 20 most tobacco dependent counties in the U.S. are in Kentucky. Thus, as one of the most tobacco-dependent states, Kentucky is particularly vulnerable to changes in the tobacco economy. It has been suggested that tobacco farmers in Kentucky may start new businesses as an alternative to tobacco production and that this will revitalize rural economies. In this paper the unique data from an ongoing “natural

experiment” in the Appalachian region were used. Seven hundred two individuals in Kentucky were surveyed, first, to explore what factors correlate with entrepreneurial intentions, and second, to compare the effect of these factors across genders. Five hundred forty-two surveys were usable for the analysis reported in this paper, 117 being from females and 425 males. Males were overrepresented in the sample; therefore direct comparison of entrepreneurship rates across gender would not be reliable. The sample, however, allows analyzing what factors significantly correlated with entrepreneurial intentions within each gender.

The data were collected from the summer of 2005 through the fall of 2006 when tobacco farmers just started to receive their first buyout checks. During this period, the economy was just starting to adjust to the new environment and a number of people were in the process of forming entrepreneurial intentions. Table 3 reports the descriptive statistics on some variables.

Table 3. Descriptive statistics

	Planning to start a new business		Not planning to start a new business		Overall	
	N = 99		N = 443		N = 542	
	<i>Frequency</i>	<i>%</i>	<i>Frequency</i>	<i>%</i>	<i>Frequency</i>	<i>%</i>
<i>Economic factors</i>						
1. Do you plan to quit tobacco production?	41	0.41	164	0.37	205	0.38
2. Unemployed	6	0.06	24	0.05	30	0.06
3. Spouse unemployed	8	0.08	28	0.06	36	0.07
4. Income						
Income 1	23	0.23	56	0.13	79	0.15
Income 2	41	0.41	232	0.52	273	0.50
Income 3	23	0.23	103	0.23	126	0.23
Income 4	12	0.12	52	0.12	64	0.12
<i>Demographic factors</i>						
5. Age						
Age 1	6	0.06	23	0.05	29	0.05
Age 2	11	0.11	32	0.07	43	0.08
Age 3	18	0.18	58	0.13	76	0.14
Age 4	14	0.14	100	0.23	114	0.21
6. Gender						
Female	29	0.29	88	0.20	117	0.22
Male	70	0.71	355	0.80	425	0.78
7. Ethnicity						
White	87	0.88	430	0.97	517	0.95
Non white	12	0.12	13	0.03	25	0.05
8. Marital status						
Married	73	0.74	363	0.82	436	0.80
Divorced	6	0.06	19	0.04	25	0.05
9. Education						
No high school	26	0.26	108	0.24	134	0.25

Table 3 (cont.). Descriptive statistics

High school	18	0.18	102	0.23	120	0.22
College	33	0.33	144	0.33	177	0.33
Graduate school	22	0.22	89	0.20	111	0.20
10. Death in the family	46	0.46	142	0.32	188	0.35
11. Divorce	15	0.15	35	0.08	50	0.09
12. Rural community	70	0.71	358	0.81	428	0.79
<i>Continuous variables</i>	<i>Mean</i>	<i>St. dev.</i>	<i>Mean</i>	<i>St. dev.</i>	<i>Mean</i>	<i>St. dev.</i>
13. Children	0.63	0.97	0.51	0.98	0.53	0.98
14. Starter SE	3.42	.65	3.27	.65	3.30	.66

**4. Empirical results**

In this section the results of the hypotheses testing are reported.

**4.1. Correlation among dependent and independent variables.** Table 1 (see Appendix A) reports correlation coefficients between independent and dependent variables in this study.

It shows that the dependent variable correlates significantly with a number of independent variables, such as household income (for income less than \$29,000,  $r = .12$ ,  $p < .01$ ; for income \$30,000-\$79,999,  $r = -.09$ ,  $p < .05$ ), gender ( $r = .09$ ,  $p < .01$ ), ethnicity ( $r = -.10$ ,  $p < .05$ ), death in the household within last three years ( $r = .12$ ,  $p < .01$ ), divorce within last three years ( $r = .10$ ,  $p < .05$ ), entrepreneurial self-efficacy ( $r = .09$ ,  $p < .01$ ) and residence in the rural community ( $r = -.12$ ,  $p < .01$ ). These correlations in part support some of our hypotheses; for example, entrepreneurial intentions are higher in the low income group, positively correlate with entrepreneurial self-efficacy and with recent changes in the regular family routine, such as death and divorce.

**4.2. Correlations among independent variables.** Among the most important correlations between independent variables are correlations between gender, income and the decision to quit tobacco production.

From Table 1 (see Appendix) one can see that the decision to quit tobacco production significantly correlates with income and gender. *Ceteris paribus* lowest income group and highest income group were more likely to decide to quit tobacco production. Males were more likely to continue growing tobacco than females. These correlations will be taken into account when results of the logistic regression are analyzed.

Among other interesting correlations are correlations between income and education level, with lower education among low income groups, and higher education for higher income groups; higher entrepreneurial self-efficacy for the age group between 35 and 54 years old; and lower for the low income group.

**4.3. Logistic regression.** To investigate the determinants of the rural entrepreneurial activities, regression analysis was performed explaining the entrepreneurial intentions among males and females. Corresponding to the formulated hypotheses above, 15 independent variables were included in the regression. This analysis with power .8 can reveal the effects of medium to large size (.18) for the female sample ( $N = 117$ ), of small to medium size (.045) for the male sample ( $N = 425$ ), and of small to medium size (.035) for the pooled sample ( $N = 542$ ). The results are presented in Table 4.

Table 4. Regression analysis explaining entrepreneurial intentions

	Pooled			Females			Males		
	B	S.E.	Odds ration	B	S.E.	Odds ration	B	S.E.	Odds ration
<i>Economic factors</i>									
Plan to quit tobacco	.308	.247	1.361	2.860	.850*	17.453	-.184	.290	.832
Unemployed	-.003	.005	.997	.055	.034****	1.056	-.007	.005	.993
Spouse unemployed	-.003	.004	.997	.021	.016	1.021	-.005	.005	.995
Income less than \$29,999	.813	.323*	2.256	1.714	.842**	5.551	.632	.445	1.882
<i>Personal factors</i>									
ESE	.423	.188**	1.526	-.151	.551	.860	.677	.225*	1.968
<i>Demographic factors</i>									
Age <35	-.537	.556	.585	3.044	1.375**	20.983	-1.165	.801	.312
Age 35-54	.504	.387	1.655	.594	1.320	1.811	.717	.431***	2.049
Ethnicity	-.025	.013**	.975	-1.012	1.325	.363	-.021	.016	.980

Table 4 (cont.). Regression analysis explaining entrepreneurial intentions

Married	.028	.058	1.028	-4.783	1.351*	.008	.396	.558	1.485
Education	.181	.133	1.199	1.255	.513**	3.507	.100	.159	1.105
Children	-.010	.009	.990	-.045	.034	.956	-.013	.011	.987
Death	.681	.243*	1.976	2.160	.832*	8.673	.526	.286***	1.692
Divorce	.685	.354**	1.983	-.082	1.213	.921	.792	.436***	2.207
Rural	-.015	.007**	.985	-.026	.022	.974	-.017	.008**	.983
Gender	.501	.275***	1.650						
Constant	-4.253	.800*	.014	-1.743	3.082	.175	-5.030	1.026*	.007
<i>Model fit</i>									
-2 Log likelihood	473.766			68.863			346.06		
Cox & Snell R Square	.074			.412			.077		
Nagelkerke R Square	.12			.612			.131		
Hosmer and Lemeshow Test									
Chi-square (8)	6.793			6.211			5.86		
p-value	.559			.624			.663		

Note: \*, \*\*, \*\*\* Correlations are significant at the 0.01, .05, .1 levels respectively; \*\*\*\* correlation approaches significance at .105 significance level.

Table 4 demonstrates that economic, personal and demographic factors affect males and females differently.

**4.4. Economic factors.** Females that plan to quit tobacco production were 17 times more likely to plan to start a new business than other females. Unemployed females were 5 percent more likely to start new businesses than employed at the marginal significance level of .105. Females with household income less than \$29,999 a year were 5.5 times more likely to start new businesses. These findings support the “push” hypothesis, i.e. females are likely to be “pushed” into starting a new business by changing local economic conditions and lack of household income. According to our analysis, males’ decisions to start new businesses did not correlate with any of the economic factors included in the analysis. Therefore the “push” hypothesis was not supported for males.

**4.5. Demographic factors.** Based on the sample, the highest rate of entrepreneurial intentions for females is in the youngest age group (younger than 35 years old) while for males the highest rate of entrepreneurial intentions is among individuals between 35 and 54 years old. This result supports hypotheses H3 and H3a. However, it should be noted that for males the rates of entrepreneurship were expected to be highest in the younger than 35 years old age group, while for females the rates of entrepreneurship were expected to be highest for the age group 35 to 54 years old. To explain this discrepancy further analysis of the males’ and females’ roles within a household is needed.

Education level significantly correlated with the decision to start new businesses for females, but did not correlate with entrepreneurial intentions among males. Therefore hypotheses H4 and H4a were supported.

Married females were almost 99 percent less likely to form entrepreneurial intentions than unmarried females; marital status did not affect entrepreneurial intentions among males. Death in the family within the last three years affected both females and males, but its effect on females was almost four times stronger than on males. Divorce within the last three years did not affect females significantly, but strongly affected males; men who divorced within the last three years were 2.2 times more likely to plan starting new businesses than men who did not go through divorces within the last three years. Finally, males who reside in the rural communities were 2 percent less likely to plan new businesses than males in suburban and urban communities. The effect on females on the rural setting was not significant. Therefore hypothesis H5 was supported.

**4.6. Personal characteristics.** Entrepreneurial self-efficacy strongly correlated with entrepreneurial intentions among males. As the individual self-efficacy score increased by 1 point, the probability that an individual will form entrepreneurial intentions increased almost two times. For females the correlation between entrepreneurial self-efficacy and entrepreneurial intentions was not significant, which supports hypothesis H6.

**4.7. Industry structure.** Seventy males and 29 females who indicated that they plan to start new businesses provided information about what kind of businesses they plan to start. Their responses were categorized into three broad groups: service/food/retail, farm-related activities, and other. The category “other” included insurance, development, construction, agricultural tourism and many

others. Figure 1 depicts distributions of the planned businesses by types for both genders.

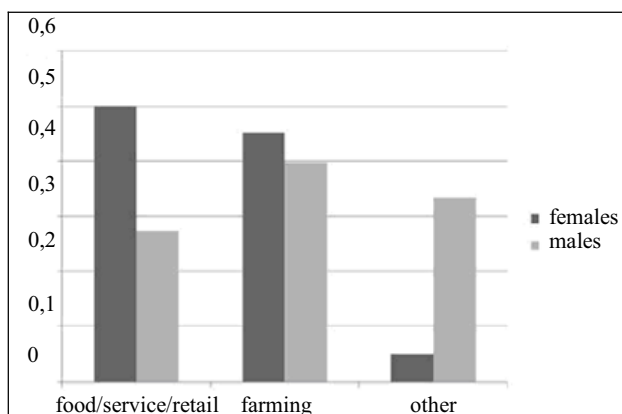


Fig. 1. Types of new businesses by gender

In conformity with hypothesis H2, Figure 1 illustrates a strong tendency of female to plan businesses toward service/retail/food, and a strong tendency of male planned businesses toward other types of ventures. The observed differences were statistically significant ( $\chi^2(2) = 6.826, p < .05$ ).

**4.8. Pooled sample.** Logistic regression analysis was performed on the pooled sample. The results of this analysis are very similar to the male sample (possibly because males were over represented in the sample) with two exceptions. First, low income was shown to significantly correlate with entrepreneurial intentions. Individuals with household incomes less than \$29,999 were 2 times more likely to start a new business than those with incomes greater than \$30,000. Second, ethnicity was shown to significantly correlate with entrepreneurial intentions, with whites being 2.5 percent less likely to plan starting a new business than non-whites. Effect of gender was significant; females were 1.65 times more likely to plan starting a new business than males. However this result should be treated with caution, since gender was significantly correlated with plans to quit tobacco production and with low income.

Overall, the model used in this paper offered a better explanation of entrepreneurial intentions among females than among males. For the female sub-sample, 61 percent of the variation in the dependent variable was explained by the set of the regressors, while for the male sub-sample the same set of regressors explained only approximately 13 percent of variation. Possibly, entrepreneurial intentions among males can be explained by other factors, for example, availability of off-farm employment opportunities, or by “desire for autonomy and control over one's life” as it was suggested by prior research based on urban datasets (e.g., Cromie and Hayes, 1991; Schjoedt and Shaver, 2004).

## Discussion and conclusion

The purpose of this paper was to investigate the factors influencing females’ and males’ entrepreneurial intentions in the rural setting during the transition period of the local economy.

This paper has an important empirical contribution, since it analyzes the rural sample that consists of both individuals who are planning to start new businesses and individuals who are not planning to start new businesses, providing therefore an opportunity to compare characteristics of both groups. The respondents were surveyed during the ongoing natural experiment in the Appalachian region’s transition of the local economy to free market, which allowed evaluating differences in how males and females respond to the changing local economy. Finally, the sample allowed estimating the effect of internal family events on the decision to start a new business.

The main result of the paper is that the analysis supports the hypothesis that females are “pushed” into entrepreneurial activities by changing economic environments and lack of household income. The analysis also illustrates that the family structure and internal family events, such as death of the household member or divorce, strongly influence a decision to start a new business; and that these effects vary by gender.

There are several indications of a higher rate of entrepreneurship among females than among males in the rural setting during the period of transition of the local economy. However this result has to be treated with caution, since females were under-represented in the sample, and gender correlated with other determinants of entrepreneurial activities, i.e. decision to quit tobacco production and low household income.

The model used in this paper offers a better explanation of entrepreneurial intentions among females than among males. Possibly, entrepreneurial intentions among males can be explained by other factors suggested in the literature based on urban datasets, for example, availability of off-farm employment opportunities, pull hypothesis, i.e. desire for autonomy and control over one's life, and other community, cultural, and political factors (Cromie and Hayes, 1991; Reynhold et al., 2002; Schjoedt and Shaver, 2004; and others). More gender specific data are required to further explore these and other effects. In summary, more systematic collection of the rural based data may have contributed to the general understanding of determinants of rural entrepreneurship and of the differences between male and female entrepreneurship.

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Appendix A

Table 1. Pearson correlations between dependent and independent variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1. Planning to start a new business	-																			
2. Planning to quit tobacco production	.04	-																		
3. Unemployed	-.03	-.01	-																	
4. Spouse unemployed	-.02	.13**	.30**	-																
5. Income, Less than \$29,999	.12**	.09*	-.03	-.21**	-															
6. Income, \$30,000-\$79,999	-.09*	-.14**	.04	.02	-.42**	-														
7. Income, \$80,000-\$119,999	.00	.01	.02	.08	-.23**	-.55**	-													
8. Income, More than \$120,000	.01	.10*	-.06	.09*	-.15**	-.37**	-.20**	-												
9. Age, <35	.02	-.03	.01	-.15**	.16**	-.01	-.11**	-.01	-											
10. Age, 35-54	.06	-.05	-.01	-.06	-.01	.03	.00	-.04	-.07	-										
11. Age, 55-64	.06	.00	.08	.05	-.06	.06	-.01	-.02	-.10*	-.12**	-									
12. Age, >65	-.08	-.09*	-.13**	-.11**	.15**	.01	-.06	-.09*	-.12**	-.15**	-.21**	-								
13. Gender	.09*	-.15**	-.02	-.08	.15**	.04	-.08	-.12**	-.01	-.05	-.03	.10*	-							
14. Ethnicity	-.10*	.01	-.02	-.04	-.04	.02	-.02	.03	-.09*	.02	.03	.04	-.02	-						
15. Married	.01	.05	-.01	.04	-.01	-.04	.04	.03	-.01	.00	-.10*	.02	.01	-.00	-					
16. Education	.01	.02	.11*	.50**	-.27**	-.07	.19**	.16**	-.08	.01	.03	-.16**	-.11**	.04	.10*	-				
17. Children	-.06	.04	.36**	.21**	-.08	.03	.04	-.00	-.04	-.02	.08	-.11*	-.09*	-.00	.01	.09*	-			
18. Death	.12**	-.04	.06	.04	-.05	.10*	-.03	-.05	.10*	.06	-.00	-.10*	.03	.00	-.06	-.04	.09*	-		
19. Divorce	.10*	-.03	.03	-.06	.05	-.03	-.01	.00	.09*	-.05	.04	-.04	.03	-.06	-.15**	-.05	.04	.08	-	
20. Rural community	-.12**	-.00	-.04	-.07	-.06	.06	.01	-.03	-.03	.04	-.02	-.07	.00	-.01	-.01	-.08	-.01	-.02	-.01	-
21. Entrepreneurial SE	.09*	-.03	.10*	.04	-.10*	-.01	.08	.02	.10*	.06	.01	-.06	-.07	.01	-.10*	.06	.08	.09*	.05	-.06

Note: \*, \*\* Correlations are significant at the .01 and .05 levels respectively (2-tailed).