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Tobacco Farmer Interest and Success in Diversification

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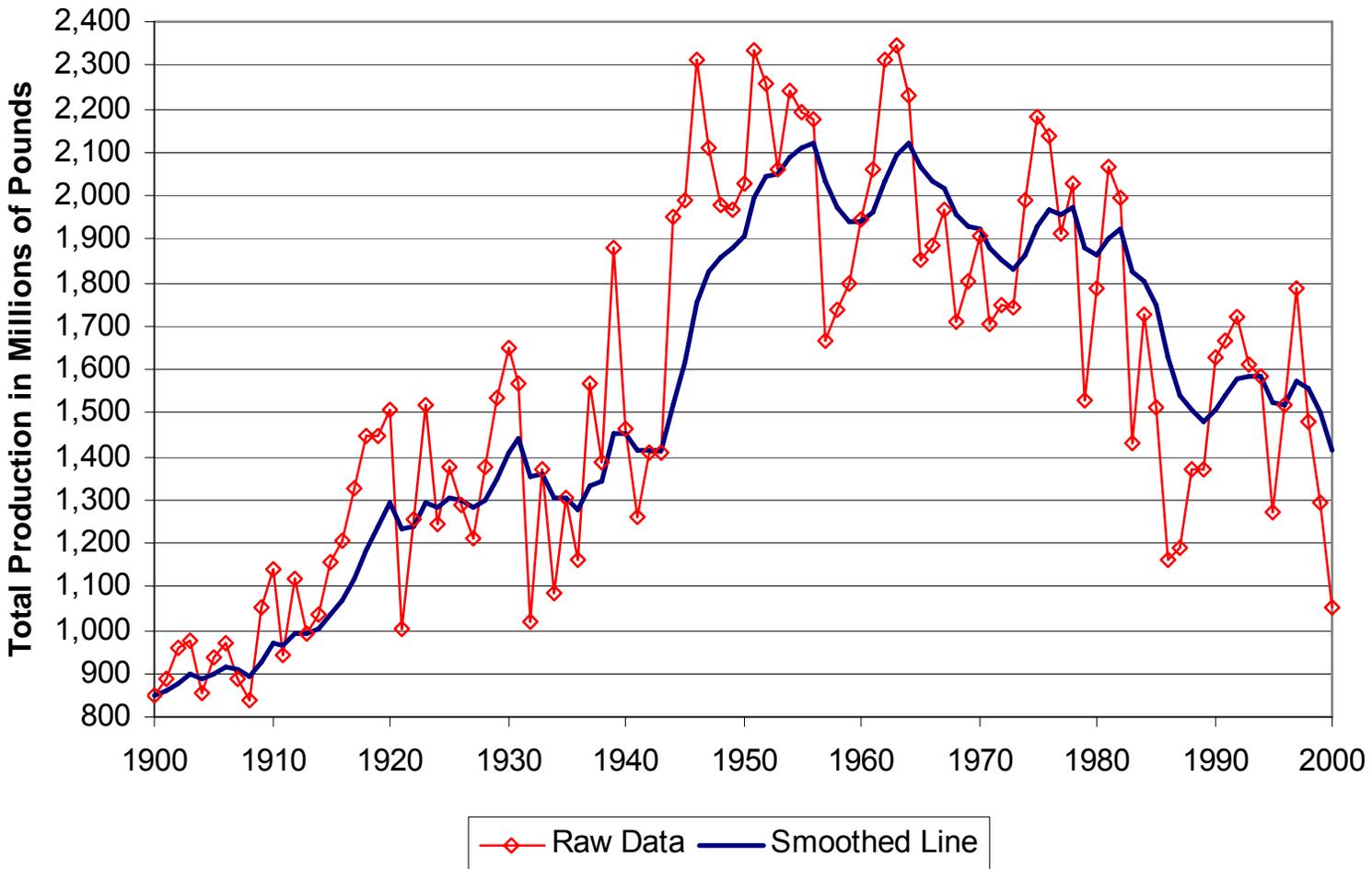
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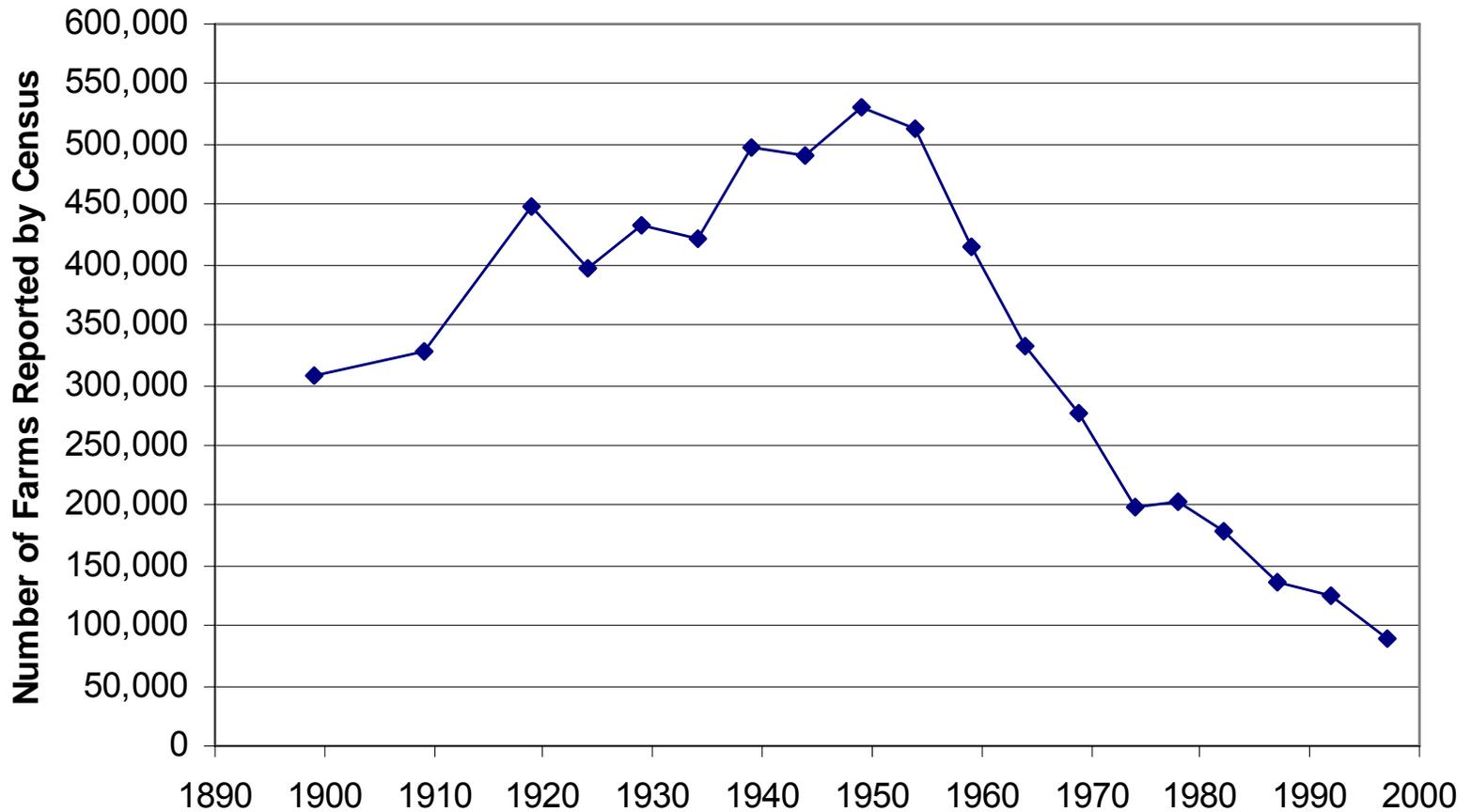
Rapidly Changing Tobacco Market Conditions

- Falling demand for domestic tobacco
- Increasing reliance on international trade
- Rising production costs
- Sharp reductions in quota levels, followed by October 2004 termination of the quota system and price supports
- Rapid development of direct contracting with manufacturers
 - From very little before 1999 to 80% of flue-cured by 2001
- Following long period as highly profitable crop, ERS C&R data have shown negative residual returns in 4 of the past 5 years

U.S. Tobacco Production



U.S. Farms Growing Tobacco



Purpose of the Study

- Develop survey and collect data from NC tobacco farmers on farm and household characteristics, tobacco production and marketing, and attitudes regarding various programs, policies, and entities affecting tobacco markets
 - Largest tobacco-producing state, about 40% of national production
- Evaluate tobacco farmer attitudes towards and interest in diversification into alternatives to tobacco
- Examine ability of tobacco farmers and tobacco-dependent communities to adjust to changes taking place

Tobacco Quota and Price Support Programs

- Quota program with price supports was instituted in 1930s to limit production and keep prices up
- Farmers had to own or lease marketing quota to grow tobacco
 - Right to grow could not be transferred across county lines (except burley tobacco in TN)
- Contributed to making tobacco a very profitable crop
- Over past 30 years, US prices rose to about 50% higher than world price
 - Percentage of imported tobacco soared
- Quotas were cut by about 60% between 1997 and 2004
 - Number of farms growing tobacco dropped by 39% between 1997 and 2002

Tobacco Quota Buyout

- Removal of quotas and price supports will
 - Lower tobacco prices
 - Allow geographic relocation of production
- Expected to speed transition to fewer, larger tobacco farms
- Smaller and older farmers are likely to stop growing tobacco
 - In our most recent survey in Jan 2004 (pre-buyout), about a third of respondents indicated they would exit if there were a buyout
- Tobacco farmers and quota holders will receive buyout payments for the next 10 years to aid in transition, though top 20% of recipients will receive about 80% of payments

Diversification

- As the number of tobacco farms and income from tobacco has declined, there has been a great deal of interest in developing alternative sources of income, particularly in tobacco-dependent communities of the south
 - Tobacco is grown in over 500 U.S. counties in 23 states, but production is concentrated in selected regions of NC, KY, VA, TN, SC, and GA
- Influx of buyout funds could provide opportunities for investment in new enterprises, but it has proven difficult in the past to identify sufficiently profitable substitutes for tobacco

Model

- Assume that farm households maximize NPV of stream of expected utility subject to time, production, and budget constraints under price and production uncertainty
- Reduced-form equations for econometric estimation can be written in general form:
 - Land in use $i = f(\text{HH characteristics, resource endowments, market incentives, risk and uncertainty, and biophysical factors})$
 - Time allocated to use $i = f(\text{HH characteristics, resource endowments, market incentives, risk and uncertainty, and biophysical factors})$

Data

- Panel survey of NC tobacco farmers drawn from 14 of the 15 highest-producing counties for flue-cured tobacco in the state
 - Fielded 1997, 1999, 2001, 2004 (and another round late '05)
- Combined with secondary data on market variables
- HH Characteristics
 - Demographics (age, gender, race), education, tobacco use, self-indicated barriers to diversification, treatment county
- Resource Endowments
 - Total acreage owned, indicator variables for married, children

Data (2)

- Market Incentives
 - Expected tobacco revenue per acre, index of expected revenue for other crops, average county wage, quota lease price, indicator variable for proximity to urban county
- Risk and Uncertainty
 - County-level tobacco yield variance, index of yield variance for other crops
- Time dummies to capture changes in tobacco quotas and other policies impacting tobacco production

Regressions

- ACRESGROWN - acres of tobacco grown (some of those in sample have 0 because they lease out all of their quota)
 - Estimated as Tobit
- ACTIVE – actively seeking opportunities for farm diversification
 - Estimated as probit using clustering by HH, same for 3 below
- INCPROFIT – identified ways to increase profitability of alternative products through processing or marketing activities
- OFFFARM – household has off-farm income
- OWNOFF – farm operator works off-farm

Results: Tobacco Acreage Grown

- Time dummies vary large and significant, reflecting changes in quota levels
- Acreage decreases with educational attainment, increases with resource endowments
- HH that indicated a need for additional skills before they could diversify or the lack of other ag products as profitable as tobacco had significantly more tobacco acreage
- Less acreage in treatment counties with a lagged effect
- Expected revenue from tobacco has negative impact and no effect of yield variance, but expected revenue and yield variance for substitute crops have expected signs

Results of Tobit Regression of Tobacco Acreage Grown

	Coeff	SE		Coeff	SE
AGE	1.726**	0.673	TOTALLAND	0.052***	0.002
AGESQ	-0.026***	0.006	ER_TOB	-0.005***	0.001
MALE	17.287***	4.182	ER_OTHCROPS	-13.233*	7.444
WHITE	18.677***	4.766	OFFWAGE	1.229*	0.967
ED_HS	-3.024	3.439	URBAN	-7.723*	4.515
ED_SOME	-6.725*	3.737	P_LEASE	2.312	5.043
ED_COLL	-13.814***	3.802	YRISK_TOB	-0.078	0.053
USETOBACCO	-3.950*	2.103	YRISK_OTH	4.795***	1.675
BARR_LOANS	-4.356*	2.295	1996	20.675**	9.150
BARR_NOINT	-3.481	2.192	1997	17.820***	6.045
BARR_SKILLS	5.388***	2.060	1998	2.228	4.628
BARR_PROFIT	18.943***	3.520	1999	-20.239***	6.747
TX_DUR	-0.039	3.574	2000	-37.112***	10.684
TX_POST	-7.914*	4.114	2002	-39.636***	13.855
MARRIED	11.410***	3.365	2003	-32.981***	9.778
CHILDREN	26.763***	3.953	Constant	-3.012	29.083

Results: Actively Seeking Diversification Opportunities

- Almost 68% seeking on-farm diversification opportunities
- Most strongly related to having educational attainment of high school graduate or above
- HH headed by white males are significantly less likely to show interest in diversification than households headed by women or minorities
- Being married had positive effect, consistent with greater HH time resources making it easier to diversify
- Tobacco lease price had expected positive sign
- Treatment effect during program (1997-2001), but not after end

Probit Regression for Actively Seeking Diversification Opportunities

	Coeff	SE	Marg		Coeff	SE	Marg
AGE	-0.019	0.028	-0.007	TOTALLAND	0.000	0.000	0.000
AGESQ	0.000	0.000	0.000	ER_TOB	0.000	0.000	0.000
MALE	-0.527***	0.166	-0.159	ER_CROPS	0.261	0.313	0.091
WHITE	-0.426***	0.208	-0.132	OFFWAGE	0.021	0.028	0.007
ED_HS	0.494***	0.150	0.168	URBAN	-0.087	0.190	-0.031
ED_SOME	0.515***	0.159	0.166	P_LEASE	0.370*	0.208	0.130
ED_COLL	0.562***	0.168	0.178	YRISK_TOB	-0.002	0.002	-0.001
USETOBACCO	0.102	0.085	0.036	YRISK_OTH	0.081	0.072	0.028
BARR_LOANS	0.077	0.082	0.027	SYR99	0.489	0.301	0.158
BARR_NOINT	-0.278***	0.080	-0.099	SYR01	0.858	0.769	0.255
BARR_SKILLS	-0.048	0.079	-0.017	SYR04	0.805	0.728	0.260
BARR_PROFIT	0.135	0.134	0.049	Constant	-0.236	1.440	
TX_DUR	0.203*	0.117	0.069				
TX_POST	-0.041	0.144	-0.014				
MARRIED	0.328**	0.145	0.121				
CHILDREN	-0.048	0.160	-0.017				

Results: Increase Profitability of Farm Products through Processing or Marketing

- About 45% have increased profitability on non-tobacco products through processing or marketing innovations
- Few significant variables
- Total acreage owned has positive effect
- Lack of interest in diversification is negative predictor
- Higher yield risk for tobacco and other crops both increase the probability of increasing profits, which may suggest that HH in higher-risk counties had greater potential for increasing profits

Results: Off-farm Income

- 51% have off-farm income, 19% of operators work off-farm
- Age and education are important determinants:
 - Positive effect of age, negative for age squared
 - Education levels of having attending at least some college increase probability of having off-farm income
 - As expected, being married has positive effect
- Tobacco lease price has positive effect on probability of having off-farm income
- Qualitative results for farm operators working off-farm are similar, except that that off-farm wage is highly significant, total acreage has a negative impact, and quota lease price is not significant

Conclusions

- Changes taking place in tobacco markets have increased interest in identifying potential substitute income sources for tobacco farmers and their communities
- Findings suggest that farmers' decisions about tobacco acreage grown are shaped in expected ways by expected revenue and yield risk associated with alternative crops and proximity to an urban county
 - HH characteristics very important determinants
- Results generally show that farmers are interested in diversifying their income, but identify many barriers and less than half have identified any ways to increase profitability of alternative products
- Providing programs to encourage diversification may be necessary to aid in transition to other agricultural products
- Confounding influence of the impending buyout, which created incentives to grow tobacco and hold on to quota in order to qualify for buyout payments, could partially account for limited influence of economic incentives

Future Research

- Look at the impacts of the recent tobacco quota buyout
 - Farmer attitudes
 - ◆ Tobacco farming
 - ◆ Diversification
 - ◆ Tobacco manufacturers
 - ◆ Tobacco control
 - Tobacco production
 - Income
 - Future plans
- Examining satisfaction with shift towards direct contracting