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Abstract

This study examines movements in per farm real output in the US counties, and tests for convergence of output at the aggregate, regional, and divisional levels. The estimations are carried out for the period 1982-1992 and for its two constituent sub-periods, 1982-87 and 1987-92. For the period 1982-92, results show weak convergence at aggregate and regional levels. For the first sub-period 1982-87 (the second sub-period 1987-92) weak convergence (strong divergence) takes place at aggregate and regional levels, except the Northeast region showing strong divergence (weak convergence). These results indicate the Northeast region having distinct movements in farm output compared to the rest of the US. This can, in part, be attributed to the type of farming prevailing in Northeast. At divisional level the estimates are not robust neither for the entire period nor its sub-periods. Overall, the conjecture of the neoclassical growth model is supported at aggregate and regional levels, with unclear pattern at the divisional level.

JEL classification

R11 Analysis of growth, developments, and changes
R12 Size and spatial distribution of regional economic activity
R58 Regional development policy

Key words: Convergence of farm output, US farm policy

Section 1

Introduction[1] [2]

Intuitively speaking, the concavity of a production function in the capital stock implies that capital-poor economies will grow sufficiently faster than capital-rich ones to offset differences in initial conditions. This is the premise of the neoclassical model (see Solow, 1959). However, starting with Romer (1986) and Lucas (1988), a body of theoretical research has challenged the strong cross-country implications of the neoclassical model. "New growth" theorists have pointed to the failure of per capita output to equalize across poor and rich countries as evidence that there is little observable tendency for poorer economies to catch up to richer ones. They argue that the presence of non-convexities in production is a fundamental factor in growth that can create a non-diminishing relationship between an economy's initial conditions and its output level over arbitrarily long horizons. The striking differences in the empirical implications of the neoclassical and new growth perspectives have generated a voluminous literature (see Baumol (1986), De Long (1988), Barro (1991), Barro and Sala-i-Martin (1991, 1992) among others). The main concern of these studies has been how an economy's average growth comoves with initial income. Specific questions addressed in this respect are twofold. One is why some countries have grown rich while others remain poor; the other is whether this is a cyclical phenomenon or part of a long term tendency.

Empirical tests can be classified in two categories (see Temple (1998) for an extensive survey of the literature). Tests in the first category have focused on the cross-section correlation between initial per capita output levels and subsequent growth rates for a group of countries. A negative correlation is considered as evidence of convergence as it implies that, on average, countries with low per capita initial income are growing faster than those with high initial per capita income. Tests in the second category, on the other hand, have examined the long run behavior of differences in per capita output across countries. And convergence is interpreted to mean that these differences are always transitory in the sense that long run forecasts of the difference between any pair of countries converge to zero as the forecast horizon grows. According to the latter category, convergence implies that output differences between two economies cannot contain unit roots or time trends, and that output levels in these economies must be cointegrated[3]. For convergence to take place this approach stipulates for

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[3] If a variable X_t has a unit root, then taking the first-difference of X_t would yield stable var(X_t). Cointegration requires the same degree of differencing for the non-stationary variables, allowing the analysis of a long run relationship between them. If, for example, a pair of variables is cointegrated, these variables are said to have a long run relationship.

equal long run forecasts at a fixed time, and this makes it necessary to have information on countries' transition dynamics with respect to their growth rates relative to the average growth rate in the data. Quah (1993a, 1993b, 1996a) has developed an approach that allows the integration of the transition information in the cross-section approach with the steady state information in the time series approach. He accomplishes this by estimating a Markov transition function for the data and then by inferring the limiting distribution of the cross-section (see Temel and Tavernier (1998a, 1998b) for applications of this approach to test for convergence of labor income and farm size in the US agricultural sector).

There is abundance of empirical studies, that have applied these tests, most of which have come up with contradictory results due especially to the use of different methods. Some of these studies applied cross-section while some others time-series methods. The very existence of contradictions in empirical findings legitimizes further questioning of the assumptions of the methods applied. One such study is the work of Bernard and Durlauf (1996). They discuss in depth the implications of explicit and implicit assumptions of cross-section and time-series methods. In the case of cross-section analysis, the key assumption is that the data under investigation are generated by economies far from a steady-state, but in time series analysis is that the data possess well-defined population moments in either levels or first differences. It is these assumptions that cause cross-section test results to lean towards rejecting the no-convergence null hypothesis and time-series test results towards accepting it.

The present study contributes the literature in two aspects. First, the study is the first in the literature, investigating convergence of farm output *within* the US. Within-analysis has two apparent advantages over the between-country analysis. One is that we do not have to worry about the possible influence of technological developments and of the central government policies on the process of convergence as all states are subject to the same constraints in this regard. The second is that factors are mobile within the US, at least there is no regulatory barrier against factor mobility across states. This is important since the essence of the convergence argument lies in free flow of factors to locations where their productivity is high. Consequently, if convergence is plausible at all, it surely is more likely to be true across regions within a country where growth-related variables are more likely to be similar and where regions are subject to similar constraints (see Barro and Sala-i-Martin (1991) for a test of convergence across the states in the US and Button and Pentecost (1993) for convergence across the EC regions).

With respect to the second aspect, it is surprising that the literature has, with few exceptions (see Quah, 1996b), neglected that macro fluctuations for the most part result from micro fluctuations. The current study, therefore, concentrates on analysis of disaggregates that would help us understand the behavior of micro units as to how they respond to changes in their environment. The building blocks of macro modeling can then be characterized. More specifically, disaggregate analysis would shed light on whether there are regional or divisional leaders followed by the rest. It might very well be the case that disaggregate units have their own leaders (or centers of gravity) due to different farming activities engaged.

Taking together these aspects, this study aims at testing for convergence of the US farm output at aggregate, regional, and divisional levels. The study contributes the existing stock of empirical research by concentrating on the *cross-county variability of per farm real output* and by testing for convergence at the *disaggregate* levels over the period 1982-1992 and its two constituent sub-periods, 1982-87 and 1987-92. Our intention is to examine in depth the role that time and geography play in characterizing movements in farm output.

For the period 1982-92, results show weak convergence at aggregate and regional levels, supporting the conjecture of the neoclassical growth model: the poor counties do indeed grow faster, and have been catching up the rich ones. When it comes to the first sub-period 1982-87, weak convergence takes place at aggregate and regional levels, except the Northeast region showing strong divergence. For the second sub-period 1987-92, strong divergence emerges at aggregate and regional levels, except the Northeast region showing weak convergence. These results signal that movements in farm output in the Northeast region have to be examined in depth in order to determine the factors that lead to distinct fluctuations in this region. This contrary fluctuation in Northeast can, in part, be attributed to the type of farming prevailing, which is quite different from that in other regions. Surprisingly, the estimations at divisional level are not robust neither for the entire period nor its sub-periods. Overall, the findings suggest that regional agricultural policies are at play in closing the gap between rich and poor counties.

The remainder of this paper is organized as follows. The next section discusses the concepts of absolute and conditional convergence. Section 3 introduces the concept which is adopted by the present study, and outlines how to proceed with the testing for convergence. Section 4 discusses the features of the data set used in the estimations. Section 5 discusses estimates of the speed of convergence at the aggregate, regional, and divisional levels. Finally, Section 6 concludes the study with a summary of the key findings.

Section 2

A Brief Look at Commonly Used Concepts of Convergence

There is a wide range of studies on convergence (Barro, 1991, 1997, among others), investigating whether the per capita GDP of poor and rich countries tends to converge, with poor countries catching up with rich ones. That is, the faster the poor countries grow relative to the rich ones, the sooner the poor will catch up with the rich.

It should be noted that empirical studies concern different features of the convergence process, and therefore apply different concepts of convergence. To determine, for example, whether inequality in per farm output has tended to decrease across the US counties, two directions should be followed. The first direction is to analyze whether the dispersion of per farm output has decreased over time. The reduction in dispersion would suggest the presence of σ-*convergence*. In order to find out whether σ-*convergence* exists, one has to compute the dispersion of per farm output across the US counties that is measured as the standard deviation of its logarithm. The second direction is to examine whether poor farms tend to grow faster than rich ones, so that the poor tends to catch up with the rich. This phenomenon is called β-*convergence*. To test for β-*convergence* one has to examine first whether absolute convergence (poorer farms growing faster than richer ones) exists and then whether conditional convergence occurs besides initial income levels are included. To test for *absolute convergence*, an equation of the following form is to be estimated

$$T^{-1} \ln(Y^T/Y^0) = \beta_0 + \beta_1 \ln(Y^0)$$

where *ln* stands for natural logarithm, and Y^T and Y^0 stand for final and initial level of per capita GDP (years *0* and *T* and *0*). Similarly, to test for *conditional convergence* an equation of the following form is to be estimated

$$T^{-1} \ln(Y^T/Y^0) = \beta_0 + \beta_1 \ln(Y^0) + \sum_j \gamma_j Z_j$$

where Z_j stands for other selected variables (e.g., education, fertility, health) that also influence the rate of growth. In the following section we describe the concept of convergence which has been adopted from Chatterji and Dewhurst (1996) and utilized by the present study.

Section 3

Describing the Convergence

For the most part, the literature on convergence within a country has focused on the estimation of a regression equation of the form

$$T^{-1} \, ln(\frac{Y_i^T}{Y_i^0}) = \beta_0 + \beta_1 \, ln(Y_i^0) \qquad (1)$$

where i indexes N cross-section units, i=1,…,N. The variables Y_i^T and Y_i^0 respectively denote the value of farm i's output at time T and the value at initial year 0. Convergence is then defined as β_1 <0, implying that growth over the period [0,T] is negatively correlated with the initial farm output. However, as pointed out by Chatterji and Dewhurst, a negative value for β_1 does not guarantee that the variance of Y is lower at the end of the period than at the beginning, nor does it guarantee that the set of cross-section units converges to a steady-state where Y is equalized across units. He shows that $-2<\beta_1<0$ is the condition required for diminishing variance and convergence to a steady-state. We therefore distinguish between weak convergence $\beta_1<0$ and strong convergence $-2<\beta_1<0$.

Following Chatterji and Dewhurst, convergence of farm output in the US agricultural sector is investigated at aggregate, regional, and divisional levels. The purpose in examining the convergence at three levels is to determine whether or not there is a group of states that behave in the same manner with respect to movements in per farm real output. In grouping the states that fall into a specific region or division, we utilize the official definition of a region or a division by the Bureau of Census. Such grouping is more similar to that adopted by Ben-David (1994). Our definitions are spatially oriented, which is the key distinction between the present study and the work by Chatterji and Dewhurst. This interest originates from the possibility that some of the states might act as if they are members of a club with a common objective. This cannot be captured by the estimation of equation (1). To test convergence at regional and divisional levels, we recast equation (1) in the following form:

$$T^{-1} \, [ln(\frac{Y_j^T}{Y_j^0}) - ln(\frac{Y_{ij}^T}{Y_{ij}^0})] = \beta_{1j} [ln(Y_j^0) - ln(Y_{ij}^0)] \qquad (2)$$

$$ln(\frac{Y_j^T}{Y_{ij}^T}) = \gamma_j \, ln(\frac{Y_j^0}{Y_{ij}^0}) + \varepsilon_{ij} \qquad (3)$$

where the statistical error term ε_{ij} is assumed to satisfy the assumptions of the Ordinary Least square Estimation (OLS) technique. Define $Y_j^t = max_i [Y_{ij}^t]$ where *i* indexes counties in region/division *j*, *t* indexes time periods *t=0,1,…,T*. The dependent variable in equation (3) defines the gap between per farm output of county *i* in club *j*, Y_{ij}^t, and its maximum level in club *j*, Y_j^t. For notational convenience we define $\gamma_j \equiv (1 + T\beta_{1j})$ which is estimated using equation (3). Strong convergence requires $-1 < \gamma_j < 0$; weak convergence $0 < \gamma_j < 1$; and strong divergence $1 < \gamma_j$.

The most notable feature of equation (3) is that it assumes a different steady-state across regions/divisions as the coefficient γ_j is indexed over regions/divisions. We conjecture in this study that convergence rather strongly occurs at regional level, putting more emphasis on the importance of regional policies and infrastructure.

Section 4

Description of Data Set

The data set used in this study was obtained from the 1992 Census of Agriculture. Counties are units of observations, denoted by index *i*. The aggregate (or pooled sample) is the one that includes all of the counties in the U.S., and consists of 3130 counties. Formally, the Bureau of Census divides the entire U.S. into four main regions: Northeast (NE), Midwest (MW), South (S), and West (W). Each region is further divided into divisions. The divisions in the Northeast region include New England (NE) and Middle Atlantic (MA); those in the Midwest are East North Central (ENC) and West North Central (WNC); those in the South are South Atlantic (SA), East South Central (ESC), and West South Central (WSC); finally, those in the West are Mountain (M) and Pacific (P). Each division itself is a group of states. For example, the division of New England in the Northeast region includes Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, and Connecticut.

The key variable of interest denoted by Y_{ij}^{t} is per farm output of county *i* in region/division *j* at time *t*. It is defined $Y_{ij}^{t} = (S_{ij}^{t} / P_{j}^{t}) / F_{ij}^{t}$ where S_{ij}^{t} and F_{ij}^{t} denote farm sales and the number of farmers in county *i,* region *j* at time *t*, respectively. P_{j}^{t} denotes price received by farmers in region *j* at time *t*.

Overall interregional disparities refer to some measure of farm output dispersion around the average output. The statistics, such as standard deviation and coefficient of variation, would serve as approximations of dispersion and allow for the comparisons of the movements in farm output across aggregate, regional, and divisional levels.

Section 5

Empirical Results

The convergence of per farm output across the U.S. counties is examined by estimating the equation (3) using White's heteroscedasticity-consistent ordinary least squares method. The estimations are performed at the aggregate, regional, and divisional levels over the entire period 1982-1992 and its two constituent sub-periods, 1982-87 and 1987-92. Furthermore, the coefficient of variation is utilized to provide general guidelines for the characterization of output disparities: the larger the coefficient the larger the disparities.

Aggregate Convergence. Output disparities are examined using the coefficients of variation for the *level*, Y_{ij}^{t}, and the *gap*, $ln(Y_{j}^{T} / Y_{ij}^{T})$, for the pooled sample. The figures given in the first colon named "aggregate" in Table 1 show large disparities, reflected by the large coefficient of variation, in the level over the entire period 1982-1992 due possibly to the presence of peripheral counties. However, for the same period relatively small changes are observed in the coefficient of variation for the gap, which is also given in the colon named "aggregate". The latter, however, hints narrowing disparities between the richest county and the poorest counties.

In Table 2 we report the regression estimations of absolute convergence for the pooled sample. The total variation (R^2) is very high in all of the models estimated, and White's heteroscedasticity-consistent *t*-values are strongly significant at any level of significance. These estimations support weak convergence for the first sub-period, 1982-1987; divergence for the second sub-period, 1987-1992; and weak convergence for the entire period, 1982-1992. As a whole, the relation in the first sub-period dominates over the second sub-period, and weak convergence characterizes the movements in farm output across all of the U.S. counties for the entire period.

Regional Convergence. The coefficient of variation at the regional level is also given in Table 1. For the Northeast region the coefficient of variation corresponding to the level is the smallest compared to other regions', revealing that in this region farm output disparities in levels are smaller in level than those prevailing in other regions. Surprisingly, when farm output disparities are measured by the gap, the Northeast region appears to have larger disparities compared to disparities in other regions. This indicates that this region has experienced a relatively weak σ-convergence, and hence inequality in farm output across counties in the region has largely remained unchanged. The strongest σ-convergence, on the other hand, has taken place in the Midwest region, suggesting that the dispersion in farm output has significantly decreased.

Table 3 presents the regression estimations for absolute convergence at the regional level. The estimations indicate high R^2 for all of the models estimated. The findings are threefold. First, except the Northeast region, the rest experiences weak convergence in the sub-period 1982-1987. Second, except the Northeast region, the rest experiences divergence in the sub-period 1987-1992. Finally, all of the regions exhibit weak convergence in the entire period 1982-1992. These results suggest that region specific policies are more likely to narrow down farm output inequalities across the US counties. Complementary to this argument, differences in regional policies or in regional institutional structures might lead to divergence in Northeast during the first and second sub-periods 1982-1987 and 1987-1992. It is likely that local government policies and regional institutions affect agricultural income growth. This is to say that policies that work well in one region may not do so in another. Evidence found in this study signals that de facto regional institutions should be under close investigation to identify the channels through which they influence farm production. This examination is especially salient for the robust weak convergence that is present at regional level.

Divisional Convergence. The motivation behind separate estimations for the divisions in each region is that states which are geographically close to each other would tend to engage in similar or complementary farming activities, and therefore, farm income growth in these states is very likely to show similar fluctuations. Consequently, one would expect these states to act as members of a club with respect to their farm output.

It is found that the ENC division in Midwest and the MA division in Northeast have the lowest coefficients of variation with respect to the level as the very same divisions have the highest coefficients with respect to the gap. This suggests that these divisions experience the largest dispersion in farm output or lowest σ-convergence. The smallest disparities take place in the WNC division in Midwest, indicating the largest σ-convergence (see Table 1). When compared to the regression estimations given in Table 4, these dispersions are observed to be consistent with the fact that the ENC and MA divisions exhibit divergence while the WNC division shows weak convergence.

Table 4 reports the regression results for the New England and Middle Atlantic divisions in the Northeast region. The first column presents the results of relating the gap in 1987 to the gap in 1982; the second column the gap in 1992 to that in 1987; and the third column the gap in 1992 to that in 1982. It is not only surprising but also puzzling that these two divisions act as if they are on the opposite sides of a scale: weak convergence in one division is accompanied with strong divergence in the other or vice versa. For example, in the sub-period 1982-1987 New England weakly converges (i.e., γ_j=0.88) while Middle Atlantic strongly diverges (i.e., γ_j=1.36). In the sub-period 1987-1992 New England strongly diverges (i.e., γ_j=1.09) while Middle Atlantic weakly converges (i.e., γ_j=0.83). Finally, during the entire period 1982-1992 New England weakly converges (i.e., γ_j=0.98) as Middle Atlantic strongly diverges (i.e., γ_j=1.22). Weak convergence as a whole in the Northeast region suggests that New England is acting as the leader. It is our conjecture that different farming types lie behind such opposite fluctuations in farm output.

With respect to the Mountain and Pacific divisions in the West region, findings reveal divergence in the Mountain division regardless of the time periods considered, and divergence in the Pacific division only for the sub-period, 1987-1992. The observation that the West region itself weakly converges suggests that the Pacific division acts as the leader in West. As regards the divisions in the South, strong divergence emerges as an outcome, except for the West South Central (WSC) division in the sub-period 1982-87. The observation that the South region weakly converges can be considered as an indication of the WSC division being the leader. Finally, in Midwest, convergence in the sub-period 1982-1987 of the East North Central and West North Central divisions dominates over the farming activities in the entire region since the region reveals convergence at regional level. Overall, it should be said that results are not robust across neither divisions nor time periods.

Our finding that convergence is stronger at the regional level than that in the divisional level suggests that (i) regional policies are more influential than local state policies, (ii) regional policies pave the way for interactions among the states.

Section 6

Concluding Remarks

This paper has presented evidence that aggregate and disaggregate movements in farm output are contradictory in their implications for convergence. More specifically, the study finds weak-convergence at aggregate and regional levels while no clear-cut pattern of movements is present at divisional level. It is also observed that in the most recent past (1987-1992) the West, South, and Midwest regions move away from each other, and that the Mountain division in the West and the East South Central division in the South regions have experienced divergence regardless of the time periods considered.

As supported by our results, states in a division respond to changes in their environment quite differently from those states in a region. Divisions appear to be heterogeneous in reacting to changes while, on the contrary, regions act similarly and heterogeneity disappears. This suggests that additional information becomes available when switched from divisional to regional analysis.

Our results, although not directly related to, evoke an old issue that institutions matter in the development process. This is beyond the scope of this study but worth to mention once more. The fact is that the entire country is subject to the central agricultural policies while states differ with respect to the workings of local institutions. This suggests that policies that work well in one state may not do so in another. De facto institutional differences in local governments (for example, differences in application of the same law) no doubt would account for some of the differences in local growth rates, making the catching up feature of agricultural income growth is conditional on the workings of local institutions. Further research is needed to shed light on the reasons for divergence at divisional level and convergence in aggregate and regional levels. It is our hope that this study would provoke greater interest in that direction.

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Table 1. Aggregate, Regional, and Divisional Coefficient of Variation

Years	Using the level: Y_{ij}^{t}				
	Aggregate	**Regions**			
		Northeast	West	South	Midwest
1982	1.12	0.52	1.08	1.35	0.92
1987	1.15	0.58	1.07	1.40	0.93
1992	1.23	0.58	1.15	1.44	1.06
	Using the gap: $ln(Y_{j}^{T} / Y_{ij}^{T})$				
	Aggregate	**Regions**			
		Northeast	West	South	Midwest
1982	0.27	0.31	0.31	0.29	0.23
1987	0.29	0.32	0.31	0.30	0.25
1992	0.29	0.37	0.32	0.30	0.24

	Divisions								
	Using the level: Y_{ij}^{t}								
	Northeast		West		South			Midwest	
	NE	MA	P	M	WSC	SA	ESC	WNC	ENC
1982	0.58	0.49	1.20	0.92	1.47	1.04	1.16	0.98	0.50
1987	0.61	0.56	1.12	1.00	1.48	1.15	1.24	1.00	0.47
1992	0.64	0.55	1.20	1.08	1.54	1.18	1.35	1.12	0.50
	Using the gap: $ln(Y_{j}^{T} / Y_{ij}^{T})$								
	Northeast		West		South			Midwest	
	NE	MA	P	M	WSC	SA	ESC	WNC	ENC
1982	0.28	0.46	0.37	0.35	0.29	0.33	0.32	0.24	0.59
1987	0.38	0.32	0.38	0.31	0.31	0.31	0.32	0.26	0.56
1992	0.34	0.41	0.37	0.31	0.31	0.34	0.31	0.26	0.48

Table 2. Absolute Convergence: Regression Results for the Pooled Sample

Estimated Coefficient	Dependent Variable from Model 3: $ln(Y_{j}^{T} / Y_{ij}^{T})$		
	1987-82	1992-87	1992-82
γ_i	0.93 (706)	1.03 (762)	0.96 (586)
R^2	0.93	0.94	0.90
Log-L	220	296	-462
N	3040	3038	3051

t-statistics, given in parenthesis, are all statistically significant at the 0.01 level.. *t*-statistic for β_j can be obtained as follows. First, calculate the estimated β_j from β_j=

(γ_j-1)/T where T=5. Then, calculate *t*-statistic using (β_j/se(β_j)) where standard error(β_j)=standard error(γ_j) since Variance(1)=Variance(T)=0.

Table 3. Absolute Convergence: Regression Results for the Regions

Estimated Coefficient(s)	Dependent Variable from Model 3: *ln*(Y_j^T / Y_{ij}^T)					
	Northeast			**West**		
	1987-82	1992-87	1992-82	1987-82	1992-87	1992-82
γ_j	1.01 (120)	0.92 (91)	0.93 (73)	0.95 (185)	1.02 (247)	0.97 (170)
R^2	0.84	0.84	0.75	0.91	0.93	0.87
Log-L	29	19	-31	-4	17	-93
N	206	204	209	413	415	414
	South			**Midwest**		
	1987-82	1992-87	1992-82	1987-82	1992-87	1992-82
γ_j	0.99 (472)	1.01 (504)	0.99 (373)	0.89 (570)	1.08 (564)	0.96 (486)
R^2	0.93	0.94	0.90	0.94	0.95	0.92
Log-L	-73	-42	-407	465	485	247
N	1371	1369	1378	1050	1050	1050

t-statistics, given in parenthesis, are all statistically significant at the 0.01 level.

Table 4. Absolute Convergence: Regression Results for the Divisions

Dependent Variable from Model 3: $ln(Y_j^T / Y_{ij}^T)$

Estimated Coefficient(s)	**Northeast**					
	New England (NE)			Middle Atlantic (MA)		
	1987-82	1992-87	1992-82	1987-82	1992-87	1992-82
γ_j	0.88	1.09	0.98	1.36	0.83	1.22
	(48)	(49)	(49)	(71)	(67)	(47)
R^2	0.77	0.74	0.74	0.71	0.85	0.73
Log-L	-2	-5	-8	-26	18	-30
N	65	64	65	141	140	144

	West					
	Mountain (M)			Pacific (P)		
	1987-82	1992-87	1992-82	1987-82	1992-87	1992-82
γ_j	1.02	1.08	1.11	0.93	1.01	0.94
	(112)	(197)	(103)	(107)	(128)	(101)
R^2	0.87	0.92	0.81	0.93	0.93	0.91
Log-L	-15	22	-87	-7	-8	-31
N	273	273	274	140	142	140

	South								
	South Atlantic (SA)			East South Central (ESC)			West South Central (WSC)		
	87-82	92-87	92-82	87-82	92-87	92-82	87-82	92-87	92-82
γ_j	1.05	0.97	1.01	1.05	1.06	1.11	0.97	1.03	1.00
	(269)	(263)	(190)	(179)	(234)	(164)	(280)	(301)	(223)
R^2	0.93	0.93	0.86	0.92	0.93	0.89	0.93	0.94	0.89
Log-L	-56	-61	-207	-10	18	-69	-8	1	-128
N	541	539	544	362	362	364	468	468	470

	Midwest					
	East North Central (ENC)			West North Central (WNC)		
	1987-82	1992-87	1992-82	1987-82	1992-87	1992-82
γ_j	0.98	1.17	1.15	0.89	1.08	0.96
	(146)	(125)	(120)	(445)	(417)	(353)
R^2	0.94	0.92	0.89	0.94	0.95	0.92
Log-L	224	137	80	260	271	110
N	433	433	433	617	617	617

t-statistics, given in parenthesis, are all statistically significant at the 0.01 level.