Midwest Family Income Inequality: Is it More Cultural or Can State and Local Policy Affect It?

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Abstract

It is well known that income inequality dramatically increased after 1970. What is less known is that there was a tremendous divergence in income inequality across states. Some states experienced almost no increase in family income inequality, while other states experienced very dramatic increases. Such variation across states will be used in assessing the various causes of U.S. income inequality trends. In particular, previous research is extended by examining the role of social and cultural norms in explaining interstate differences in inequality and by considering whether state and local economic development policies can influence family income inequality. Special attention will be given to the Midwestern states. The resulting empirical model does an excellent job of explaining why states experienced such diverging family income inequality patterns. The results point to several economic factors that can explain many of the shifts in interstate income inequality after 1970; however, cultural factors were also found to be important.

Introduction

Major changes in the wage structure since 1980 are a well-known aspect in the U.S. labor market. Important changes include increasing returns to skill, experience, and education (Katz and Murphy, 1992; Freeman and Katz, 1994). However, probably the most prominent shift in the labor market is the tremendous increase in income inequality, which, of course, is closely related to the other changes. In fact, even within narrowly defined experience/education categories, wage dispersion has increased. Thus, it is not surprising that income inequality has been extensively studied in recent years.

A much less studied aspect of U.S. income inequality is the tremendous changes in traditional state and regional income inequality patterns. For instance, regions that were associated with low family income inequality in the 1960s subsequently experienced rapid increases in income inequality. Also, as will be discussed below, even *within* regions, there have been significant changes. For example, industrial midwestern states experienced some of the largest increases in income inequality after 1970, while midwestern Plains states experienced some of the smallest increases in the nation.

Following a growing trend, this study will take advantage of cross-sectional variation found in state-level data to improve on studies based solely on national data (Karoly and Klerman, 1994; Partridge et al., 1996). That is, national-based studies (without state-level data) of income inequality either are cross-sectional from a single time period or represent time-series data over many data periods. Clearly, national cross-sectional studies have difficulties in analyzing time-series trends. However, even with time-series national data, it is hard to sort out true causal relationships from spurious relationships when comparing two-trended time variables. Limited degrees of freedom complicate the issue (e.g., regressing returns to education on foreign trade shares over a 20 year period). By contrast, pooled cross-sectional state-level data has many more degrees of freedom. Also, pooled cross-state data allow the use of time dummies to account for national secular trends. This almost entirely eliminates the chance that the regression coefficients for the variables reflect spurious correlations with income inequality. Finally, pooled cross-sectional data allow us to estimate the unique state fixed effects, which will prove very useful below.

In recent years, a few income inequality studies have used state-level or regional-level data. These studies suggest that interstate differences in inequality can be explained by recent international immigration,[1] metropolitan shares of the population, labor-force participation rates, and the share of female-headed households (Topel, 1994; Karoly and Klerman, 1994; Levernier et al., 1995; Partridge et al., 1996). These studies found much less support that other factors such as declining unionization and manufacturing are important in explaining interstate inequality.

Two potential determinants of interstate differences in income inequality have received essentially no attention in previous research. The first is the role of state and local economic development policies. Given the current trend for devolution of government power to the states, an important public-policy issue is whether state and local government policies influence income inequality.

Social and cultural norms are the second unexplored factor that may be contributing to greater income inequality. One reason for this lack of emphasis is that economists tend to downplay the role of nonmarket institutional factors. However, this may be an important omission regarding spatial differences in income inequality. A case in point is comparing the United States and Canada (Card and Freeman, 1994). Although the U.S. and Canadian economies are very similar in terms of structure and work force characteristics, the U.S. has experienced a much faster increase in income inequality in the last quarter century. Closer to home, Partridge et al. (1996) found large state fixed effects, even after accounting for a multitude of potential factors. The authors suggested that cultural factors could be at work, but they did not formally test this hypothesis.

There are some important implications if social and cultural norms help explain interstate differences in income inequality. Most important, if they help explain (cross-sectional) differences in income inequality for states, they may also be an explanation for national increases in income inequality over time. Likewise, they may also help explain why countries have experienced such diverse income inequality trends. Moreover, the role of social and cultural norms is also closely related to the effectiveness of government policy. That is, if income inequality is strongly affected by the attitudes and beliefs of the population, then government economic policies aimed at reducing income inequality will be much less effective.

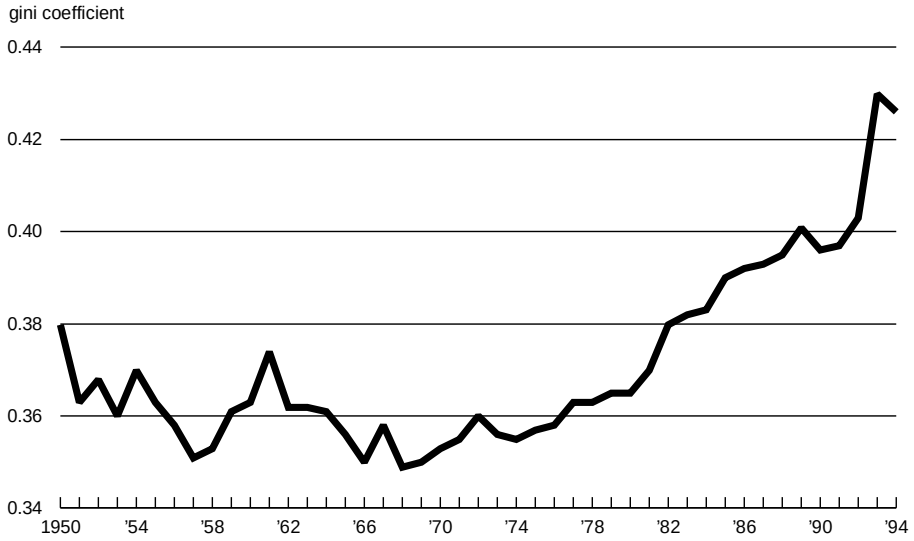
With these issues in mind, this study will examine the determinants of cross-state income inequality. In particular, emphasis will be given to the possible role of traditional state and local economic initiatives as well as the potential role of cultural and social norms. The discussion will also stress the Midwest.

Trends in National and Regional Income Inequality

There are many different inequality measures, including wage inequality, wealth inequality, and household income inequality. This study will focus on family income inequality. This emphasis is consistent with the significance that policymakers seem to attach to *families*. Moreover, family members represented 94% of the population in 1960 and more than 84% of the population in 1990 (1960 and 1990 *Census of Population*).[2] However, by examining families, households that are solely composed of single individuals or groups of unrelated individuals are omitted, which should be kept in mind when interpreting the results.

As noted above, U.S. income inequality began increasing sometime around 1980. This can be seen for family income inequality using the Gini coefficient, where the Gini ranges from zero to one and is positively related to inequality.[3] Figure 1 shows the annual U.S. family income Gini coefficient between 1950 and 1994. The Gini trended down until the late 1960s, remained stable or slightly increased during the 1970s, and began to increase rapidly after 1980.[4] This suggests that before a factor is accepted as a good explanation behind changes in family income inequality, it must not only explain greater inequality after 1980, but also why income inequality ceased its downward trend in the late 1960s.

Figure 1 1950–1994 U.S. Family Income Inequality: Gini Coefficient



Source: U.S. Dept. of Commerce, P60.

There are many explanations for greater U.S. income inequality after 1980. One explanation is the secular increase in the demand for skilled workers resulting from skill-biased technological change, which disproportionately increased wages for workers at the top end of the distribution (Bound and Johnson, 1992; Katz and Murphy, 1992). Another possible cause is that declines in manufacturing resulted in the loss of "good" blue collar jobs (Bluestone, 1990). A closely related theme is increased foreign trade and greater outsourcing of production work (Borjas et al., 1992; Murphy and Welch, 1992; Borjas and Ramey, 1994; Feenstra and Hanson, 1996). Other studies have stressed key demographic shifts including more female-headed households (Karoly and Burtless, 1995) and increased international immigration (Borjas et al., 1992; Murphy and Welch, 1992; Topel, 1994; Partridge et al., 1996). However, the ultimate impact of international immigrants remains controversial (Borjas, 1994). Changing institutional characteristics such as declining unionization may have also played a role (Card and Freeman, 1994). Lastly, Partridge et al. (1996) suggested that changes in cultural and social norms may be important. Nonetheless, there is no consensus regarding the relative importance of these factors.

As indicated above, even though income inequality has increased nationally, states and regions have diverging patterns. This can be seen in table 1. For each of the 48 contiguous states, column (1) reports the 1990 Gini coefficient, while columns (2) and (3) report the Gini rank for each state in 1990 and 1960.[5] Mississippi had the most family income inequality in 1960 and the second most in 1990, while Utah had the least inequality in 1960 and New Hampshire had the lowest inequality in 1990.

In 1960, New England states, Pacific states, and some western states had the lowest income inequality. Conversely, the South Atlantic and South Central states had the highest levels of inequality in 1960. Manufacturing states in the Mid Atlantic and East North Central regions all had income inequality that was below that of the median state. Conversely, the midwestern Plains states had family income inequality that was above average in 1960.

By 1990, regional patterns had significantly shifted. Relative to the rest of the nation, the coastal South Atlantic states running from Delaware through Georgia and the East South Central states all experienced relative decreases in income inequality. In the case of Delaware and the Carolinas, this change was quite substantial. Nonetheless, probably the largest *relative* decrease in family income inequality occurred in the West North Central region, especially in the Dakotas and Iowa. The Pacific and Mid Atlantic regions experienced large relative increases in income inequality, as well as the heavily populated states of Ohio, Illinois, and Michigan. Overall, regarding the Midwest, there was a divergence. The more populated states experienced greater relative increases in income inequality, while the Plains states, Indiana, and Wisconsin experienced smaller relative increases.

Levernier et al. (1995) report that income inequality declined in every contiguous state except one in the 1950s and declined in 36 states in the 1960s. However, 25 states experienced greater income inequality in the 1970s, while family income inequality rose in every state in the 1980s. Thus, state-level data follow the national trend—generally declining inequality through the 1960s, stable or slightly rising in the 1970s, and accelerating during the 1980s. Columns (4)-(7) of Table 1 show the changes in inequality between 1970–90 and 1980–90. Specifically, columns (4) and (6) show the change in the Gini between 1970–90 and 1980–90, where again, a larger number is associated with a greater increase in inequality. Columns (5) and (7) report the corresponding ranking for the two periods.

Although there are some differences between the 1970–90 and the 1980–90 periods, they tend to show similar patterns. Thus, most of the focus will be on the 1970–90 period. With few exceptions, southern states had some of the smallest increases in income inequality over the period. Nonetheless, it is striking how little inequality increased in the Plains states. The Dakotas had the two smallest increases in inequality, while Nebraska had the fourth smallest increase between 1970 and 1990. Urbanized, industrial states in the Pacific, Mid Atlantic, and East North Central regions tended to have sharp increases in inequality. In fact, Ohio and Michigan had the largest increase over the 20-year period, while Illinois had the largest increase during the 1980s.

Overall, regional inequality patterns completely diverged during the 1970–90 period. Again, one of the more striking patterns is the divergence within the Midwest. In what follows, an empirical model is developed to help differentiate which factors are more important in explaining these trends. Moreover, after accounting for the major determinants of inequality, unique state fixed effects can also be estimated and used to analyze the role of cultural and social norms.

Table 1 Family Income Inequality Trends: Gini Coefficients[a]

Region	1990 Gini (1)	1990 Gini Rank[b] (2)	1960 Gini Rank[c] (3)	1970-1990 Change in the Gini[d] (4)	1970-1990 Change in Gini Rank[e] (5)	1980-1990 Change in the Gini[f] (6)	1980-1990 Change in Gini Rank[g] (7)	State Fixed Effects[h] (8)
New England:								
Maine	.3766	40	44	.0486	17	.0430	23	–0.53
New Hampshire	.3527	48	47	.0357	30T	.0309	42	–0.60
Vermont	.3654	47	31	.0294	36	.0250	46	–0.00
Massachusetts	.3900	29	46	.0560	11	.0446	18	0.65
Rhode Island	.3778	37	39	.0518	15	.0336	40	–0.76
Connecticut	.4033	18	41	.0673	5	.0545	9	2.52
Mid Atlantic:								
New York	.4373	4	25	.0683	3	.0596	1T	2.98
New Jersey	.3997	22	37	.0567	10	.0476	15	0.96
Pennsylvania	.3999	20	32	.0659	7	.0587	3T	0.58
East North Central:								
Ohio	.3939	26	43	.0809	1	.0587	3T	–0.44
Indiana	.3767	39	33	.0547	12	.0467	16	–0.87
Illinois	.4094	16	27	.0674	4	.0596	1T	1.85
Michigan	.3993	21	38	.0703	2	.0534	10T	0.25
Wisconsin	.3675	46	35	.0415	22	.0365	36	–1.12
West North Central:								
Minnesota	.3804	36	23	.0344	33	.0390	29T	0.01
Iowa	.3728	43	19	.0258	41	.0110	48	0.44
Missouri	.4035	17	16	.0265	40	.0448	17	1.49
North Dakota	.3756	42	18	.0066	47	.0304	43	–3.56
South Dakota	.3842	34	15	–.0018	48	.0265	44	–1.37
Nebraska	.3774	38	20	.0164	45	.0338	39	–0.29
Kansas	.3894	30	24	.0394	24T	.0387	31	0.82
South Atlantic:								
Delaware	.3766	41	21	.0096	46	.0194	47	2.97
Maryland	.3854	33	26	.0364	29	.0376	32	–0.45
Virginia	.4006	19	13	.0356	32	.0359	37	–0.01
West Virginia	.4158	13	14	.0448	21	.0576	5	0.14
North Carolina	.3971	23	9	.0461	20	.0342	38	0.18
South Carolina	.3967	24	6	.0357	30T	.0332	41	–0.77
Georgia	.4204	9	8	.0394	24T	.0369	35	1.00
Florida	.4260	7	12	.0280	38	.0402	26	1.26
E. South Central:								
Kentucky	.4272	6	3	.0182	44	.0432	22	1.36
Tennessee	.4185	11	4	.0285	37	.0370	33T	1.38
Alabama	.4200	10	5	.0270	39	.0370	33T	0.88
Mississippi	.4401	2	1	.0221	43	.0411	25	1.66
W. South Central:								
Arkansas	.4145	15	2	.0295	35	.0256	45	–0.01
Louisiana	.4518	1	7	.0488	16	.0521	12	1.22
Oklahoma	.4175	12	11	.0305	34	.0390	29T	1.22
Texas	.4373	3	10	.0573	9	.0570	6	0.98
Mountain:								
Montana	.3887	31	29	.0397	23	.0484	14	–1.76
Idaho	.3886	32	34	.0386	26T	.0423	24	–1.86
Wyoming	.3721	44	36	.0471	18	.0558	7	–1.32
Colorado	.3945	25	30	.0255	42	.0438	21	–0.42
New Mexico	.4272	5	17	.0382	28	.0534	10T	–0.98
Arizona	.4155	14	22	.0525	14	.0555	8	–1.74
Utah	.3686	45	48	.0386	26T	.0391	28	–4.58
Nevada	.3936	27	40	.0626	8	.0440	20	–1.85

Table 1 *(continued)* Family Income Inequality Trends: Gini Coefficients[a]

Region	1990 Gini (1)	1990 Gini Rank[b] (2)	1960 Gini Rank[c] (3)	1970-1990 Change in the Gini[d] (4)	1970-1990 Change in Gini Rank[e] (5)	1980-1990 Change in the Gini[f] (6)	1980-1990 Change in Gini Rank[g] (7)	State Fixed Effects[h] (8)
Pacific:								
Washington	.3827	35	45	.0527	13	.0401	27	–0.82
Oregon	.3915	28	42	.0465	19	.0443	19	–0.95
California	.4235	8	28	.0665	6	.0517	13	0.26
U.S. Average	.3984	na	na	.0414	na	.0421	na	0.00

[a]The Gini coefficient is positively related to income inequality. The data was derived from Levernier et al. (1995). The data was based on the 1960, 1970, 1980, and 1990 decennial Census, where the actual family income was from the preceding year (i.e., 1959, 1969, 1979, 1989).

[b]The 1990 Gini rank for the 48 contiguous states. A smaller number is associated with relatively *more* family income inequality.

[c]The 1960 Gini rank for the 48 contiguous states. A smaller number is associated with relatively *more* family income inequality.

[d]The 1970-1990 change in the Gini coefficient. A greater change is associated with a larger increase in inequality.

[e]The rank ordering of the 1970 to 1990 change in the Gini coefficient for the 48 contiguous states.

[f]The 1980-1990 change in the Gini coefficient. A greater change is associated with a larger increase in inequality.

[g]The rank ordering of the 1980 to 1990 change in the Gini coefficient for the 48 contiguous states.

[h]State fixed effects differenced from the mean using the regression shown in column (4) of table 2.

Data and Empirical Implementation

There have been many *cross-sectional* studies of interstate income inequality (e.g., Al-Samarrie and Miller, 1967; Braun, 1988; Bishop et al., 1992). However, cross-sectional state-level studies suffer from the problems of national-level studies in that it is difficult to sort out time-series trends. Also, if there are unmeasured state-level fixed effects that are correlated with the independent variables, the estimated variable coefficients would be biased. Hence, we employ state-level panel data from 1960, 1970, 1980, 1990. This allows the use of time dummies to rule out both spurious trends and state fixed effects. Moreover, given that most of the states experienced first declining and then rising income inequality over the period, it is much less likely that spurious trends or correlations between inequality and the explanatory variables will influence the results.

For the 48 contiguous states, the following empirical model for state i, year t is specified:

$$\text{Gini}_{it} \text{ X } 100 = ß_0 + \mathbf{ßX}_{it} + \sigma_t + \sigma_r + e_{it},$$

where the state's Gini coefficient is the dependent variable,[6] $\mathbf{X}$ is a vector of causal factors assumed to influence state income inequality, $\mathbf{ß}$ is a coefficient vector, and e_{it} is an error term. Also, note that the Gini is scaled up by a factor of 100. Region-neutral factors that affect income inequality, such as technological change or cultural changes, will be contained in the time dummy coefficient σ_t. Region and/or state fixed effects are in the σ_r term.

When both the time and region fixed effects are included, the coefficients for the other variables will be based only on *within*-state variation of the variables, *after* netting out national time-series changes. Hence, if there are any "errors in variables" problems or little *within*-state variation in a variable, that variable's effect will likely be understated. Conversely, if the time dummies are omitted, it is much more likely that a variable's coefficient will reflect spurious time-series correlation between that variable and the dependent variable.[7] Thus, as Karoly and Klerman (1994) noted, omitting time dummies in this model is the closest representation of national models based on time series data. Even in this case, state-level data still would have the advantage of having more degrees of freedom.

The foremost independent variables in **X** are the economic development and cultural variables. Many of the other control variables, with the exception of the economic development variables, were considered by Karoly and Klerman (1994), Lervernier et al. (1995), and Partridge et al. (1996) and are not discussed in great detail below.[8]

One of the most important tools of economic development policy is state and local taxes. State and local taxes can reduce income inequality if they are primarily aimed at the wealthy. Nonetheless, many states and localities rely on regressive sales and excise taxes. Thus, greater state and local taxes may actually *increase* income inequality, especially if government expenditures are not progressive.

Clearly, one of the most important goals of an economic development policy is greater employment growth. In the case of inequality, Bartik (1994) argued that greater economic growth disproportionately favors less-skilled workers because they have a greater opportunity to be hired and then obtain work experience. Likewise, Topel (1994) suggested that economic growth favors less-skilled workers because their wages are generally more flexible in response to cyclical and structural labor market shifts. Hence, unlike other studies, two different economic growth measures using U.S. Department of Labor data are utilized in this study. The percent change in nonfarm employment growth in the previous two years and the percent change in nonfarm employment in the previous ten years. Controlling for both measures is important because employment growth may only have short-term effects, or it may take many years for economic growth to affect income inequality. Moreover, as Bartik (1993) notes, controlling for both short-term and long-term growth is necessary if there are abrupt shifts in the state's economy or if long-run and short-run employment growth are negatively correlated.

To control for the economic structure of the economy, the farm share of the population and the goods producing (i.e., construction, mining, manufacturing) share of nonfarm employment are included in the model. One advantage of using the goods producing share of employment is that the important mining sector (in some states) will not be ignored. The goods producing share should be negatively related to inequality because it has traditionally represented an avenue for less-educated workers to obtain higher salaries. To some extent, a larger goods producing sector is often a goal of economic development strategies because policymakers often focus on attracting manufacturing plants. Regarding the farm share, it should be positively related to inequality due to the cyclical nature of farm prices, cross-sectional variations in weather, and the dispersion in farm sizes.

A cultural/institution factor is the stability or attachment of the state's citizens to their community. For example, a stable population may indicate a longer-run, more community-oriented perspective, which can be conducive for policies designed to reduce inequality or in ensuring a more stable social climate. Moreover, controlling for employment growth, states with less stability may have recently attracted lower- skilled workers trying to find work, or attracted more mobile highly educated workers. Thus, the share of the state's population that has lived in the same county for at least five years is added to the model (*Census of Population*).

The level of economic development should influence income inequality. For example, the Kuznets' (1955) inverse "U" hypothesis is that after some point, economic development is associated with declining income inequality. However, in recent years, the most advanced national economies have experienced rising income inequality, suggesting that economic development may reach a stage where it is again associated with *more* income inequality. To account for both possibilities, the level of economic development is controlled for by real per capita income and its square, where the expected coefficient signs are respectively negative and positive.

The metropolitan share of the population is also included in the model as a measure of economic development. If metropolitan areas are more likely to have bimodal economies, or they experience agglomeration effects that favor high-skilled workers (Garofalo and Fogarty, 1979), the metropolitan share should be positively related to inequality.

Average years of education for adults 25 years and older is included to measure the effect of human capital on inequality. A priori, the influence of education on inequality is not clear. Cross-sectional state-level studies suggest that the average level of education and income inequality are negatively related (Al-Samarrie and Miller, 1967; Braun, 1988). However, with greater returns to education after 1980, especially for college graduates, greater education may increase inequality (Bound and Johnson, 1992; Katz and Murphy, 1992). To further confuse matters, Levernier et al. (1995) and Partridge et al. (1996) found that neither the percent of the population with a college degree nor the percent of the population with between 12 and 16 years of education strongly influenced inequality.[9]

The male share of the labor force is also included in the model. Topel (1994) suggested that greater *female* (or lower male labor-force share) participation reduces wages for less-skilled men because women tend to compete directly with low-skilled men. This would increase family income inequality. Conversely, Bradbury (1990) suggested that greater female participation was somewhat in response to lower wages for less-skilled males. In this case, greater female earnings in low-income families could offset the decline in less-skilled male wages, indicating that the male share of the labor force could be positively related to inequality. Another labor-force characteristic included in the model is the labor-force participation rate, defined as the percent of the state's population above the age of 15 that is in the labor force, which is expected to be negatively related to income inequality.

Two important institutional features included in the model are the percent of the nonfarm labor force that is unionized and total transfer payments as a percent of personal income. Both factors should reduce income inequality, although Gottschalk (1993) found that U.S. transfer payments have almost no impact on inequality.

Several variables are included to control for labor supply and demographic features of the state. The first is the share of the population that immigrated from other countries in the previous five years. If recent immigrants primarily compete against less-skilled natives, income inequality will increase. However, if less-skilled natives migrate to other states in response to immigration (Frey, 1994), this effect will be muted. The percent of households that are female-headed is also included. With labor-force participation and female share of the labor-force already controlled for, the female-headed share coefficient should be positive if single mothers suffer work-place constraints such as obstacles to child care. Alternatively, income inequality may be greater simply because of the greater number of families in which there is only one wage earner. Finally, to control for the racial and age structures of the labor force, the percent of the population that is African American, less than 18 years old, and 65 and older are included.

Regression Results

The empirical results appear in table 2. Column (1) contains the descriptive statistics, while columns (2)-(6) contain results from various regression models. Column (2) has OLS results for the model with time period dummies but no state or region fixed effects, while the model in Column (3) adds eight major region dummies (where New England is the omitted region).[10] The results are quite similar in the two models even though the F-statistic reported at the bottom of the table suggests that the eight region dummies are jointly significant.

In both models, taxes and employment growth are statistically insignificant, suggesting a limited role for traditional economic development policies in affecting family income inequality. The goods producing employment share and the farm share were respectively negatively and positively related to inequality. One implication is that economic development efforts focused on goods producing industries may reduce inequality. A more stable population, as reflected through a greater share of long-term residents in the county (more than five years), is also negatively related to inequality. Greater labor-force participation also reduced family income inequality.

A greater proportion of female-headed households and recent international immigration appear to increase family income inequality, while the race variable was insignificant. The time dummy coefficients indicate that there was a secular increase in income inequality over the time period that is not explained by the other variables. One possible explanation for this behavior could be a region-neutral technological change (Topel, 1994), although Partridge et al. (1996) could not detect such a relationship. Overall, the results for the control variables were consistent with other interstate inequality studies.

The positive regional coefficients suggest that New England (the omitted region) had the lowest income inequality over the period, ceteris paribus, while the South Central regions had the highest inequality. Interestingly, after controlling for the explanatory factors, the West North Central region had greater income inequality than the East North Central region. This suggests that unexplained factors led to greater income inequality in the Plains states than in the Great Lakes states.

The model in column (4) replaces the regional dummies with state dummies. If there is heterogeneity within regions, adding the state dummies gives a better sense of spatial differences. Moreover, if the state fixed effects are correlated with the other variables, including the state fixed effects eliminates the resulting coefficient bias.

The bottom of table 2 shows that the state dummies are jointly significant. Moreover, an F-test of the joint null hypothesis that the state dummy coefficients differ from their respective regional dummy coefficients was significant at the 0.1% level (not shown). Thus, even after controlling for a multitude of variables, there remains a significant degree of heterogeneity across states, even within narrowly defined regions.

The coefficients are only modestly different when comparing the state fixed effect results in column (4) to the regional dummy results in column (3), although there are some differences in the degree of statistical significance. One difference is that the percent of the labor force that is male is not significant in column (4), indicating that greater relative female participation rates have relatively little influence on inequality. The tax and employment growth variables are still insignificant when state fixed effects are included,[11] and the goods producing share of employment is still statistically significant at the 5% level (one-tail).

Column (8) of table 1 shows the estimated state fixed effects differentiated from the (unweighted) mean fixed effect. The magnitude of the fixed effects shows that subtle unexplained state-by-state factors are very important even after accounting for the effects of the other independent variables. In fact, the difference in state fixed effects between Utah and New York is almost twice as large as the much discussed increase in national income inequality between 1970 and 1990. Generally, the estimated state fixed effects differ somewhat from the overall Gini rankings shown in columns (2) and (3) of table 1. The Atlantic states, running from Connecticut to Delaware, Georgia, Florida, and the South Central states, had above average state fixed effects. Conversely, the Mountain states, Oregon, and Washington had below average state fixed effects.

The Midwest states exhibit no strong pattern in both the East and West North Central regions. This was especially interesting in the West North Central region. With the exception of the Dakotas, there were no strong negative state fixed effects even though the region can be characterized as having below average Ginis (in 1990). As will be seen, because unexplained factors do not appear to play an important role, shifts in midwestern inequality can be easily explained by the observable variables in table 2.

As indicated before, if the year fixed effects are not controlled for in this model, the results should be consistent with the national-based models where secular time trends are *not* controlled for. Thus, to examine how unaccounted for national secular trends could influence these results, column (5) in table 2 reports the results from a model that accounts for state fixed effects, but omits the time dummies. For the most part, these results are similar, but there are some key differences. First, the goods producing employment share has a much larger effect when time dummies are omitted. This suggests that the popular notion that declines in the goods producing sector represent an important cause of greater income inequality is somewhat overstated, probably due to spurious correlation. Similar patterns also follow for recent

Table 2 Regression Results: Dependent Variable is the Gini Coefficient[a]

	(1) Mean (Std Dev)	(2) OLS	(3) OLS-REG	(4) FE	(5) FE W/O YEARS	(6) FE 1980-90
Gini X 100	369.8 (3.24)					
Taxes % Per Inc	10.1 (1.4)	–0.12 (1.31)	–0.002 (0.02)	–0.11 (0.96)	–0.04 (0.29)	0.07 (0.73)
2 yr % Emp Growth	4.9 (3.7)	–0.02 (0.57)	–0.02 (0.68)	0.03 (0.84)	0.08 (1.88)	–0.03 (1.01)
10 yr % Emp Growth	31.1 (18.8)	6.6E-4 (0.08)	–0.003 (0.33)	0.005 (0.47)	–0.01 (1.03)	–0.006 (0.59)
% Goods Prod	29.7 (8.6)	–0.06 (2.97)	–0.04 (1.59)	–0.07 (1.89)	–0.14 (2.80)	–0.03 (1.09)
% Farm/Pop	3.0 (2.8)	0.38 (5.36)	0.28 (3.56)	0.41 (4.58)	0.44 (3.69)	–0.18 (1.29)
% Same County 5 yrs	77.4 (6.0)	–0.11 (3.20)	–0.10 (2.61)	–0.09 (1.57)	–0.13 (1.66)	–0.08 (1.89)
Per Cap Inc	10312 (2923)	–3.9E-4 (1.04)	–4.3E-4 (1.15)	–0.002 (3.63)	–0.003 (4.11)	–0.001 (2.03)
Per Cap Inc (Sq)	1.15E+8 (6.39E+7)	1.8E-8 (1.56)	2.4E-8 (2.00)	6.3E-8 (3.73)	9.9E-8 (4.60)	4.3E-8 (2.42)
% Metro	58.19 (24.33)	0.01 (2.00)	0.008 (1.14)	0.03 (1.78)	0.04 (1.67)	–0.02 (2.75)
Avg Yrs Ed	11.2 (1.2)	–2.19 (6.67)	–1.91 (5.65)	–1.25 (2.01)	–0.05 (0.06)	–0.79 (1.70)
% Male LF	61.2 (5.5)	–0.18 (1.79)	–0.22 (2.25)	–0.004 (0.03)	–0.85 (6.56)	0.11 (0.91)
LF Part. Rate	59.2 (4.5)	–0.36 (6.01)	–0.29 (4.99)	–0.15 (2.16)	–0.31 (3.69)	–0.13 (2.45)
% Union	20.9 (9.8)	–0.03 (1.97)	–0.03 (1.72)	–0.01 (0.83)	–0.03 (1.40)	–0.06 (2.16)
% Transfer/Inc	11.9 (3.7)	0.19 (1.88)	–0.15 (1.52)	0.06 (0.52)	–0.33 (2.74)	–0.24 (2.36)
% Recent Int Migration	1.00 (0.79)	0.45 (2.77)	0.50 (3.01)	0.45 (1.84)	1.04 (3.29)	0.42 (2.59)
% Black	9.31 (9.59)	7.5E-3 (0.40)	–0.02 (1.08)	–0.02 (0.25)	–0.34 (2.79)	–0.10 (3.02)
% Fem Head	11.40 (3.38)	0.35 (4.00)	0.39 (4.75)	0.20 (2.30)	0.27 (2.31)	0.81 (6.20)
% Age <18	31.74 (4.95)	0.11 (1.31)	0.10 (1.22)	0.11 (1.04)	0.01 (0.12)	0.06 (0.53)
% Age >64	10.73 (2.18)	–0.03 (0.28)	–0.007 (0.06)	–0.20 (1.20)	–0.20 (0.93)	0.33 (2.83)
Year-90	0.25 (0.43)	9.42 (5.82)	6.46 (3.61)	12.62 (5.33)	na	2.76 (4.86)

Table 2 *(continued)* Regression Results: Dependent Variable is the Gini Coefficient[a]

	(1) Mean (Std Dev)	(2) OLS	(3) OLS-REG	(4) FE	(5) FE W/O YEARS	(6) FE 1980-90
Year-80	0.25 (0.43)	5.38 (4.20)	3.11 (2.21)	6.91 (3.85)	na	na
Year-70	0.25 (0.43)	1.97 (2.75)	0.87 (1.19)	3.37 (3.64)	na	na
Pacific	0.06 (0.24)		0.95 (1.54)			2.42 (3.26)
Mountain	0.17 (0.37)		1.14 (1.96)			2.17 (3.51)
W North Central	0.15 (0.35)		1.54 (2.81)			2.97 (4.84)
E North Central	0.10 (0.31)		0.38 (0.79)			1.86 (3.24)
Mid Atlantic	0.06 (0.24)		0.34 (0.72)			1.36 (2.50)
S Atlantic	0.17 (0.37)		1.20 (2.41)			1.98 (3.60)
W South Central	0.08 (0.28)		2.41 (3.96)			4.29 (6.55)
E South Central	0.08 (0.28)		2.78 (4.64)			3.67 (5.58)
Constant		96.3	88.6	na	na	50.7
State Fixed Effects		N	N	Y	Y	N
R-Squared		.901	.920	.961	.924	.957
F (group effects)[b]		na	4.92 (p=.001)	4.05 (p=.001)	2.51 (p=.001)	7.50 (p=.001)

[a]In parentheses are standard deviations in column (1) and t-statistics elsewhere. The one exception is p-values for the F-statistics.

[b]The F-statistic for the significance of the region dummies or the state fixed effects.

international immigrants and transfer payments. Second, average years of education have almost no effect when the time dummies are omitted (though they are negative and significant in column (4). Hence, some of the claims that greater education is increasing income inequality may be due to spurious relationships at the national level.[12] Third, the two-year employment change and percent black appear to have completely spurious results when the time dummies are omitted. Overall, this model indicates that national studies of income inequality should be cautiously interpreted when secular national trends are only partially accounted for.

To investigate whether the income inequality pattern dramatically changed after 1980, the model shown in column (3) is reestimated using only data from 1980 and 1990 with the results shown in column (6). Because this specification only has 96 observations, regional dummies are used instead of state dummies. Thus, the reduced degrees of freedom and the possibility that the omitted state fixed effects are biasing the results suggests that these results should be interpreted with some caution.

For the most part, the results are quite similar in columns (3) and (6). For example, the employment growth and tax variables remain insignificant. However, the farm share of the population no longer has a positive influence on inequality, which is consistent with Partridge et al.'s (1996) findings for the 1980s. There were also differences for the metropolitan share of the population, male share of the labor force, and the percent of the population over the age of 64. Regarding the region dummy coefficients, the West North Central dummy coefficient remains larger than the East North Central coefficient, even though table 1 showed that the West North Central region did not experience as large of an increase in income inequality over the period.

State-by-State Decomposition

The results in tables 1 and 2 suggest that both the state fixed effects and the explanatory variables explain a significant degree of the dispersion in interstate inequality. For the variables that were found to have an effect, table 3 decomposes the explained portion of the 1970–90 change in the Gini coefficient for each state. For brevity, only the variables that were significant at the 10% level (one tail) in the state fixed-effects model in column (4) of table 2 are shown. The other variables have very little impact on income inequality.

Column (1) of table 3 shows the relative change in the Gini between 1970 and 1990. This is derived by taking the 1970–90 change in the state Gini shown in column (4) of table 1 and subtracting the U.S. average change of .0414. The resulting difference was then multiplied by 100 to obtain the same scaling as used in the regression. Hence, column (1) of table 3 restates the same information as table 1, but positive numbers now reflect above-average changes in inequality and vice versa. During the period, the Mid Atlantic states, East North Central states, and California experienced significantly above average increases in inequality. The West North Central and East South Central states experienced significantly below average increases in inequality over the period.

In the Midwest, on average, the East Central states experienced about a 4.2 unit greater increase in the scale-adjusted Gini than the West North Central states. The pattern within the Midwest is quite remarkable given that the scale adjusted Gini increased by only 4.14 units nationally during the period. In fact, this difference is even greater if just Illinois, Ohio, and Michigan are considered instead of the entire East North Central region.

In column (4) of table 2, note that the time dummy coefficients increased by 9.25 points (12.62-3.37) between 1970 and 1990 compared to only a 4.14 increase in the scale-adjusted Gini nationally (100 X .0414). Given the large secular effect picked up by the year dummy coefficients, the total impact of the *other explained* factors should somewhat offset the year dummies and be negative in total.

Table 3 Decomposition of the 1970–90 Change in the Gini X 100[a]

Region	Relative 1970–90 Gini Chg[b] (1)	% Good Prod (2)	Farm Share of Pop (3)	% Same County (4)	Income[c] (5)	% Metro (6)	Avg Educ (7)	Lab Force Part (8)	Recent Int Migration (9)	% Female Headed (10)	Total Explained[d] (11)
New England:											
Maine	0.72	0.99	–0.47	0.13	–3.49	0.47	–2.00	–0.61	–0.17	0.58	–4.57
New Hampshire	–0.57	0.76	–0.03	0.13	–3.37	0.94	–2.24	–1.01	–0.17	0.48	–4.51
Vermont	–1.20	0.90	–0.71	–0.12	–3.07	0.77	–2.08	–1.15	–0.18	0.96	–4.69
Massachusetts	1.46	0.69	0.06	–0.10	–1.78	0.19	–2.29	–0.45	0.26	0.99	–2.43
Rhode Island	1.04	0.82	0.03	–0.29	–2.38	0.26	–2.44	–0.04	0.22	1.73	–2.09
Connecticut	2.59	1.00	–0.05	–0.31	–0.54	0.32	–2.35	–0.48	–0.06	1.04	–1.43
Mid Atlantic:											
New York	2.69	0.62	–0.01	–0.37	–1.16	0.15	–2.26	–0.29	0.62	1.39	–1.33
New Jersey	1.53	1.06	0.11	–0.27	–1.05	0.76	–2.38	–0.52	0.37	1.00	–0.92
Pennsylvania	2.45	0.97	–0.11	–0.09	–2.31	0.18	–2.20	–0.24	0.02	0.84	–2.95
East North Central:											
Ohio	3.95	0.85	–0.23	–0.33	–1.93	0.04	–1.94	–0.17	–0.04	1.94	–1.80
Indiana	1.33	0.86	–0.45	–0.21	–2.12	0.22	–1.90	–0.39	–0.04	1.03	–3.00
Illinois	2.60	0.82	–0.16	–0.30	–1.51	0.09	–2.16	–0.27	0.31	1.17	–2.02
Michigan	2.89	0.74	–0.28	–0.36	–1.96	0.11	–2.08	–0.10	–0.04	1.52	–2.46
Wisconsin	0.01	0.63	–0.95	–0.23	–2.54	0.32	–1.99	–0.72	0.05	0.96	–4.47
West North Central:											
Minnesota	–0.70	0.58	–0.69	–0.12	–2.55	0.35	–2.10	–0.97	0.10	0.76	–4.64
Iowa	–1.56	0.46	–0.96	–0.20	–2.46	0.28	–1.68	–0.79	0.07	0.70	–4.60
Missouri	–1.49	0.50	–0.97	–0.34	–2.48	0.07	–2.20	–0.51	–0.05	1.50	–4.49
North Dakota	–3.48	0.07	–1.46	–0.28	–3.48	0.93	–2.24	–1.17	–0.17	0.69	–7.12
South Dakota	–4.32	–0.05	–1.19	–0.09	–3.23	0.50	–1.85	–1.07	–0.05	0.67	–6.37
Nebraska	–2.50	0.28	–0.91	–0.37	–2.39	0.19	–1.90	–1.09	–0.06	1.04	–5.21
Kansas	–0.20	0.28	–0.69	–0.33	–2.38	0.38	–1.85	–0.81	0.01	1.01	–4.38
South Atlantic:											
Delaware	–3.18	0.79	–0.12	–0.48	–1.76	–0.13	–2.44	–0.73	–0.11	1.21	–3.77
Maryland	–0.50	0.68	–0.10	–0.36	–1.98	0.28	–2.59	–0.89	0.19	2.02	–2.75
Virginia	–0.58	0.62	–0.51	0.05	–3.18	0.37	–2.78	–0.87	0.08	1.11	–5.12
West Virginia	0.34	0.97	–0.59	–0.29	–2.58	0.17	–2.21	–0.11	–0.04	0.66	–4.02
North Carolina	0.47	0.84	–1.45	0.00	–3.27	0.64	–2.94	–0.47	–0.01	1.26	–5.40
South Carolina	–0.57	0.93	–0.84	–0.09	–3.54	0.70	–2.93	–0.24	–0.14	1.23	–4.93
Georgia	–0.20	0.78	–0.42	0.04	–3.23	0.50	–2.98	–0.53	0.07	1.10	–4.66
Florida	–1.34	0.41	–0.22	–0.49	–2.90	0.73	–2.11	–0.53	0.03	0.78	–4.31

Table 3 *(continued)* Decomposition of the 1970–90 Change in the Gini X 100[a]

Region	Relative 1970–90 Gini Chg[b] (1)	% Good Prod (2)	Farm Share of Pop (3)	% Same County (4)	Income[c] (5)	% Metro (6)	Avg Educ (7)	Lab Force Part (8)	Recent Int Migration (9)	% Female Headed (10)	Total Explained[d] (11)
E. South Central:											
Kentucky	–2.32	0.88	–1.19	–0.29	–3.08	0.21	–2.44	–0.46	–0.06	1.10	–5.32
Tennessee	–1.29	0.65	–1.11	–0.18	–3.45	0.62	–2.54	–0.51	–0.00	0.98	–5.55
Alabama	–1.44	0.54	–0.57	–0.20	–3.73	0.50	–2.73	–0.34	–0.07	1.00	–5.60
Mississippi	–1.93	0.72	–1.89	–0.37	–3.34	0.41	–2.55	–0.21	–0.09	1.65	–5.68
W. South Central:											
Arkansas	–1.19	0.81	–1.93	–0.30	–3.47	0.30	–2.56	–0.56	–0.04	1.18	–6.58
Louisiana	0.74	0.59	–0.37	–0.65	–2.89	0.48	–2.80	–0.16	–0.08	1.47	–4.42
Oklahoma	–1.09	0.38	–1.30	–0.61	–2.68	0.31	–2.14	–0.46	–0.09	0.81	–5.78
Texas	1.59	0.44	–0.45	–0.43	–2.63	0.27	–2.35	–0.42	0.37	1.05	–4.15
Mountain:											
Montana	–0.17	0.51	–0.52	–0.43	–2.43	–0.02	–1.81	–0.40	–0.12	0.80	–4.42
Idaho	–0.28	0.26	–1.10	–0.44	–2.79	0.15	–1.65	–0.57	0.12	0.67	–5.36
Wyoming	0.57	0.42	–0.35	–0.63	–2.44	0.97	–1.65	–0.74	–0.10	1.10	–3.43
Colorado	–1.59	0.37	–0.55	–0.61	–2.60	0.32	–2.01	–0.94	–0.10	1.43	–4.70
New Mexico	–0.32	0.27	–0.41	–0.47	–2.54	0.57	–2.11	–0.44	–0.02	0.97	–4.18
Arizona	1.11	0.50	–0.20	–0.75	–1.22	0.15	–2.03	–0.41	0.25	0.95	–2.76
Utah	–0.28	0.18	–0.36	–0.39	–2.21	–0.00	–1.56	–0.77	–0.09	0.67	–4.53
Nevada	2.12	–0.16	–0.13	–0.45	–1.16	0.07	–1.14	–0.16	0.33	1.74	–1.05
Pacific:											
Washington	1.13	0.43	–0.54	–0.52	–2.16	0.52	–1.81	–0.62	0.09	1.44	–3.19
Oregon	0.51	0.44	–0.45	–0.51	–2.38	0.24	–1.86	–0.51	0.27	0.89	–3.88
California	2.51	0.31	0.04	–0.35	–1.63	0.10	–1.41	–0.48	1.76	0.90	–0.77

[a]Decomposition of the 1970–90 change in the state Gini. Each variable's effect is the change in that variable over the period multiplied by its respective coefficient in column (4) of table 2.

[b]The 1970 to 1990 change in the Gini coefficient from table 1 minus the average U.S. change in the Gini. A positive number reflects an above average change in inequality.

[c]The effect from income and income squared.

[d]The sum of the explained factors in columns (2)–(10).

Columns (2) and (3) show the influence of changes in the size of the goods producing sector and the farm sector on the Gini during the period. On average, there is relatively little dispersion in the goods producing sector's effect, suggesting that it plays a relatively minor role in explaining interstate family inequality. However, it does help explain part of the pattern within the Midwest. That is, the greater decline in the East North Central goods producing sector increased its scale-adjusted Gini about 0.50 more on average than in the West North Central region. Declines in the farm sector reduced inequality almost universally. However, this reduction was much smaller in the Northeast and California than in other regions. Within the Midwest, changes in the farm sector reduced the scale-adjusted Gini about 1.00 on average in the West North Central region (and Wisconsin), while it only reduced the scale-adjusted Gini about 0.2 on average in Illinois, Ohio, and Michigan. Hence, changes in industry composition are somewhat important in explaining the divergence of inequality in the Midwest.

The influences of the percent of residents living in the same county for at least five years (col. (4)) and the percent living in a metropolitan area (col. (6)) show no strong regional pattern. Increases in average education reduced inequality nationally (col. (7)), where reductions were greatest in the South.

Income growth (col. (5)) tended to have a smaller negative effect in reducing inequality in the relatively wealthy northeastern states, East North Central states, and California. Conversely, income growth in the relatively poorer West North Central states and southern states tended to reduce income inequality more. This pattern can be explained by the negative income coefficient and the positive income squared coefficient in column (4) of table 2. In fact, between 1970 and 1990, income growth reduced the scale-adjusted Gini about 0.60 more on average in West North Central states than in East North Central states.

Increases in labor-force participation reduced family income inequality nationally. However, we again see relatively smaller reductions in inequality in the Mid Atlantic states, East North Central States, and California and relatively larger reductions in the West North Central states and in some southern and Mountain states. Within the Midwest, changes in labor-force participation reduced the scale adjusted Gini by less than 0.2 units in Illinois, Ohio, and Michigan and by more than 0.9 units in the West North Central states.

Recent international immigration played little role in most states during the period. Nonetheless, California is a notable exception, where increased international immigration alone increased inequality about 1.76 scale-adjusted points over the period. Modest increases in inequality due to greater immigration were also experienced in New York, New Jersey, Illinois, and Texas.

Growth in the share of female-headed households increased inequality nationally. Although there were no strong regional patterns, New Hampshire experienced the lowest increase from this factor, while growth in female-headed households played its largest role in Maryland. Regarding the Midwest, greater female-headed households increased the Gini by more than 1.5 scale-adjusted points on average in Illinois, Michigan, and Ohio and only about 0.91 scale-adjusted points on average in West North Central states.

Column (11) shows the total amount explained by the factors in columns (2) through (10). As expected, it is negative for every state, where the unweighted national average is about –4.00. Overall, the factors in columns (2)-(10) did a very good job of explaining relative changes in family income inequality between 1970 and 1990. The general pattern is the relative change in inequality is below the national average (in table 3, col. (1)) when the explained factors total less than –4.00 or the relative change in inequality is above the national average when the explained factors total more than –4.00. Remarkably, this holds in 40 out of 48 states, where the simple correlation between the values in column (1) and column (11) is .812. States where the explained factors acted to reduce inequality by a small amount were most likely to experience the largest relative increases in inequality (e.g., New York, New Jersey, Pennsylvania, Ohio, Illinois, Michigan, and California). The opposite applies to states where the explained factors acted to reduce inequality by the largest degree (e.g., in the East South Central and West North Central regions).

Within the Midwest, explained factors only reduced the scale-adjusted Gini by –2.09 on average in Illinois, Ohio, and Michigan and by only –2.75 on average in the entire East North Central region. In West North Central states, explained factors averaged about –5.26 during the period. Hence, determinants such as changes in industry composition, income, labor-force participation, and female-headed households appear to explain much of the tremendous divergence in inequality between the midwestern industrial states and the midwestern Plains states. Recent international immigration, by contrast, plays a smaller role, with the exception of Illinois.

Overall, the analysis of within-state time series variation provided explanations for *relative interstate inequality changes* between 1970 and 1990. As will be addressed in the next section, further explanations for differences in interstate inequality can be derived by examining some of the determinants of the state fixed effects.

Determinants of the State Fixed Effects

As noted before, there are large unexplained state fixed effects that persist even after accounting for the multitude of factors used in the regression models. Below, we will test whether basic cultural factors can help explain these state fixed effects. A possible explanation for cultural effects playing a role is that social norms and conventions constrain the influence of market forces on incomes. If cultural factors constrain market forces, then it is possible that some of the tremendous secular increases in U.S. income inequality over time may also be due to changes in social and cultural norms.

To further examine this issue, the state fixed effects in column (8) of table 1 are regressed on some simple cultural and sociological attributes. The first group of variables examined is the 1980 percent of the state's population in the following six religious categories: mainline Protestant, other Baptist, Catholic, Jewish, Mormon, other Christian.[13] Given these classifications, the omitted category is non Judaic/Christian and, hence, the resulting coefficients should be interpreted as relative to non-Judaic/Christian. One caveat is that religious affiliation is only viewed as an indicator of cultural or social norms and not necessarily as a causal factor. That is, the underlying cultural or social determinants of religious affiliation may be what is affecting inequality.

We also consider the influence of political affiliation. This was tested using the average percent of the state vote that went to the Democratic presidential candidate in the 1964, 1976, and 1988 elections.[14] These elections were chosen because they are spread equidistant during the period and there were no strong third party candidates. In another regression, we also examined the Democrat vote separately for these three years, but there was little effect. Finally, three major (Census) region dummies are considered, where the West is the omitted region.

Column (1) of table 4 shows the descriptive statistics and columns (2) and (3) report two different OLS models. The t-statistics use the White heteroscedasticity correction because the dependent variable uses the *estimated* state fixed effects, which can introduce heteroscedasticity of an unknown form to the model.

The model in column (2) simply regresses the state fixed effects on the religion variables. The model shows that the percentages (other) Baptist and Jewish are positively related to the state fixed effect, while the percent Mormon is negatively related to the state fixed effect. Moreover, the F-statistic reported at the bottom of table 4 and the R-square of 0.59 suggest that the religion variables as a group are strongly related to the state fixed effects. Therefore, at first glance, there appears to be a role for cultural effects to explain inequality.

One concern with the regression in column (2) is that there could be spurious regional correlations. For example, both inequality and percent (other) Baptist are greater in the South, which implies that the positive (other) Baptist coefficient may be spurious. Hence, the model in column (3) adds the three regional dummies and the percent of the presidential vote for the Democratic candidate. The percent Jewish and Mormon remain statistically significant in this model, but there are a few subtle changes. First, percent Baptist is no longer statistically significant. Second, mainline Protestant has a negative relationship that is significant at the 5% level (two tail). Third, percent Catholic and percent other Christian are respectively negatively and positively related to the state fixed effects at the 10% level (one-tail). The F-statistic suggests that, as a group, the religion variables are jointly statistically significant at the .001% level.

The percent Democrat vote was statistically insignificant. The region dummy coefficients suggest that all three regions have greater inequality than the West. The F-statistic at the bottom of table 4 suggests that the region dummies are significant as a group at the 5% level. The R-square statistic suggests that 66% of the variation in state fixed effects can be explained by this simple model.

The significance of region dummies suggests that there are still unexplained causes of the state fixed effects that are not simply associated with political preference or religious affiliation. However, the religious affiliation results are quite strong. In particular, they represent fairly strong evidence that cultural, nonmarket effects are playing an important role in determining income inequality. One implication is that if culture is a difficult characteristic for government policies to alter, it may even be more challenging for policymakers to influence income inequality. Moreover, if cultural factors play such an important role in determining state fixed effects, future research may find that cultural differences are important in explaining changes in inequality over time (e.g., the time dummies) and across countries.

Table 4 State Fixed Effects Regresssion[a]

Variable	Means (Std. Dev.) (1)	OLS (2)	OLS (3)
Fixed Effect	0.00 (1.48)		
Mainline Protestant	12.85 (6.51)	–0.012 (0.33)	–0.079 (2.03)
Other Baptist	7.82 (10.42)	0.044 (2.37)	0.008 (0.27)
Catholic	19.21 (13.95)	–0.018 (1.07)	–0.025 (1.56)
Jewish	0.24 (0.23)	3.68 (5.30)	2.43 (2.84)
Mormon	2.89 (10.30)	–0.065 (5.97)	–0.060 (7.07)
Other	8.52 (4.71)	0.010 (0.36)	0.040 (1.41)
% Democrat	50.6 (5.58)		–0.003 (0.10)
Northeast	0.188 (0.39)		1.584 (3.01)
South	0.333 (0.48)		1.806 (2.19)
Midwest	0.25 (0.44)		1.255 (2.63)
Constant		–0.634 (0.86)	
N	48	48	48
R-Square		0.59	0.66
F-Religion[b]		9.80 p=.0001	19.61 p=.0001
F-Region[c]			4.13 p=.013

[a]In parentheses are the standard deviations in column (1) and the absolute value of the White heteroscedasticity-corrected t-statistics in the remaining columns.

[b]The F-statistic for the joint significance of the six religion variables. The corresponding p-values are below.

[c]The F-statistic for the joint significance of the three region varaibles. The corresponding p-values are below.

Conclusion

This paper more closely examined interstate income patterns than previous research. Specifically, it extends previous studies by carefully examining the underlying determinants of state family income inequality and it helps explain why it diverged across states after 1970. Moreover, the role of economic development policies and social and cultural effects received much more attention in this study. Finally, special emphasis was given to the Midwest.

Examination of the Gini results suggests that there was tremendous interstate dispersion in both the level of family income inequality and the change in family income inequality over time. In particular, industrial midwestern states, such as Illinois, Ohio, and Michigan, as well as Mid Atlantic states and California, experienced relatively large increases in inequality after 1970. By contrast, West North Central and West South Central states experienced much smaller increases in inequality after 1970. Even within the Midwest, income inequality dramatically diverged across states.

Further analysis suggests that several factors played important roles in explaining post-1970 interstate inequality trends, including industry composition, income growth, labor force participation, and growth in female-headed households. These factors proved to be especially useful in explaining inequality within the Midwest. Recent international immigration played a smaller role nationally, although it appears to be important for California. Factors such as unionization and transfer payments were generally less important. Nonetheless, despite accounting for the effects of these variables, important state fixed effects remained. Regarding public policy, economic development strategies that simply increase employment or change the average level of taxes are unlikely to improve a state's income distribution. However, strategies that increase the goods producing employment share can modestly reduce inequality.

Religious affiliation was found to be strongly correlated to the state fixed effects, suggesting that cultural differences are important in explaining inequality trends. Perhaps cultural norms constrain market forces more than what is typically assumed. Moreover, if cultural forces are important within the U.S., they may help explain changes in inequality over time and across nations. Future research should focus on this possibility, where regional data appears to be especially suited for this issue.

Notes

[1] The role of immigration in affecting the cross-area wage structures has been questioned by Borjas et al. (1996).

[2] The Census Bureau defines a family as "a group of two or more persons related by birth, marriage, or adoption and residing together in the same household" (*Statistical Abstract of the United States, 1994*, p. 6). This definition has remained fairly constant since 1960. Karoly and Burtless (1995) constructed different Gini inequality coefficients for households and families, as well as Ginis adjusted for family size. Nonetheless, they found that their conclusions were unaffected by the particular Gini measure they used.

[3] Like other measures of income inequality, the Gini is imperfect (Levy and Murnane, 1992), but it has the advantage of being well known and it is probably the most widely used measure in the literature.

[4] Other measures of family income inequality show a similar trend (e.g., the income share of the wealthiest 5% of families divided by the income share of the lowest 20% of families).

[5] The state-level Gini coefficients are from Levernier et al. (1995). Due to Census constraints, the Gini was constructed for the year before the Census (e.g., for 1960, it is based on income from 1959). This also affects other studies that use Census data and it is unlikely to change the results.

[6] The Gini coefficient has the well-known characteristic that it is sensitive to changes in the middle of the distribution (Levy and Murnane, 1992). By contrast, the variance of log income is sensitive to changes in tails of the distribution. Nonetheless, Levernier et al. (1995) found that their results were not significantly affected by using either measure. Moreover, for 1980 and 1990, the correlation between the state-level Ginis and the variance of log income was .941.

[7] For example, unionization has been declining over time while the Gini has been rising over time. This relationship makes it more likely that the unionization variable will have a negative coefficient if time dummies are omitted, even if there is no causal relationship.

[8] Unless otherwise indicated, the data sources are the same as Levernier et al. (1995) and Partridge et al. (1996).

[9] Since greater dispersion in human capital should result in greater dispersion in earnings, the standard deviation of average years of education was included in some specifications. For the entire 1960–90 period, these experiments yielded insignificant results for the standard deviation variable and it was not included. However, in other models, there was weak evidence that the standard deviation was positively related to inequality after 1980.

[10] The t-statistics are the ordinary least squares t-statistics. White heteroscedasticity-corrected t-statistics were also estimated, but they were approximately the same as those currently reported.

[11] Further analysis was conducted to examine the sensitivity of the employment growth-inequality relationship. First, dropping either the ten-year employment change or the two-year employment change did not affect the remaining employment variable's statistical significance. Likewise, replacing the two-year employment change with the one-year employment change did not affect the results. Finally, omitting variables such as the labor-force participation rate and the per capita income variables had little effect on the employment growth coefficients.

[12] Further sensitivity analysis was conducted on the model by adding the share of the adult population with at least a college degree. The college graduate share had a positive coefficient that verged on statistical significance (e.g., in column (4), t=1.77 and in column (6), t=1.41). Average years of education remained negative and statistically significant and the other results were basically unchanged. Hence, there is some support for the claim that increasing returns to a *college* degree are influencing interstate income inequality. Similar experiments were conducted with the state's unemployment rate, but they were also insignificant.

[13] The mainline Protestant churches are classified as the American Lutheran Church plus those that belong to the National Council of Churches (e.g., American Baptist, Episcopal, Evangelical Lutheran, Friends, Presbyterian, United Church of Christ, and United Methodist Church). Mainline Protestant reflects a traditional grouping of Christian churches. Other Baptist includes all Baptist churches with the exception of American Baptist. The source for the religious adherent data is Quinn et al. (1982). One caveat is that these data are reported by the denominations themselves and each denomination may have a different way of calculating the number of adherents.

[14] The source for the presidential vote information was the *Statistical Abstract of the United States*.

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