The 1980s Divergence in State per Capita Incomes: What Does It Tell Us?

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During most of this century, state per capita incomes have converged. Researchers generally agree that incomes diverged between 1979 and 1988, but there is no consensus about what caused the divergence. This paper makes two significant contributions to the literature on the 1980s divergence and on the longer-term converging trend within the United States. First, it shows that the 1980s divergence was not primarily due to plunging oil prices, as is commonly argued. Instead, the most important reason for the divergence was a positive shock to some Northeast states, which had an unusually large effect on income. Second, this paper addresses the question of whether the 1980s divergence reflects a fundamental change in the long-term downward trend in income dispersion. The analysis suggests that state per capita incomes may be so close to their steady-state levels that they have stopped converging.

During most of the 20th century, state per capita incomes have converged. Many researchers, using a variety of techniques, have verified this empirical fact. (See, for example, Barro and Sala-i-Martin (1991), Browne (1989), and Coughlin and Mandelbaum (1988).) Researchers generally agree that incomes diverged between 1979 and 1988, but there is no consensus about what caused the divergence. Speculation about the reason for increased dispersion during the 1980s focuses on the role of falling oil prices. Most of the analysis views the increased income dispersion during the 1980s as a temporary departure from the long-run downward trend evident for most of this century.

This paper makes two significant contributions to the literature on the 1980s divergence and on the longer-term converging trend within the United States. First, it shows that the common interpretation of the 1980s divergence as the result of plunging oil prices is not consistent with the evidence. Instead, a positive shock to some Northeast states had an unusually large effect on income and was the most important reason that incomes diverged during the 1980s.

The second contribution of this paper is to address the question of whether the 1980s divergence represents a fundamental change in the long-term downward trend in income dispersion. This analysis suggests the possibility that incomes have stopped converging, which represents a significant departure from previous work on income dispersion within the United States.

The paper is organized as follows. Section I explores why incomes diverged during the 1980s. The remainder of the paper discusses broader issues related to convergence and the possibility that the 1980s episode reflects a fundamental change in the previous converging trend. Section II presents theoretical approaches to the question of whether incomes should converge across regions, while Section III discusses how convergence is operationalized empirically and examines the past 45 years in terms of these empirical constructs. Section IV looks at evidence regarding the extent to which the trend in dispersion changed during the 1970s. Section V summarizes the results and draws conclusions.

I. The 1980s Divergence

There is no dispute that convergence has been a persistent empirical fact within the U.S. through much of this cen-

tury.[1] This relationship holds whether convergence is measured by an econometric relationship between income levels and growth (Barro and Sala-i-Martin (1991, 1992)) or by changes in measured dispersion over time (Browne (1989), Coughlin and Mandelbaum (1988)). It holds whether studies examine relationships among Census regions (Browne (1989), Carlino (1992)), states (Barro and Sala-i-Martin (1991, 1992), Coughlin and Mandelbaum (1988)), or metropolitan areas (Eberts and Schweitzer (1994)). Figure 1 uses a standard measure of dispersion, the weighted standard deviation of log per capita personal income, to show that since 1929 dispersion in per capita personal income tended to fall, with the exception of the period between 1978 and 1988, when it rose significantly.[2]

Given the persistence of the convergence among the United States since 1929, the divergence that lasted through most of the 1980s is somewhat puzzling.[3] One recurring hypothesis, cited by Barro and Sala-i-Martin (1991) and Carlino (1992), is that the plunge in oil prices during the early 1980s can account for the divergence. This hypothesis is based on the observation that relative incomes in oil-producing states (which tended to have low incomes) fell substantially during the 1980s. Coughlin and Mandelbaum (1988) found that the oil price decline was among the most important factors explaining the divergence.

The timing of the divergence, however, is not consistent with the timing of oil price changes. Oil prices *rose* sharply in 1980 (Figure 2).[4] Given the generally low incomes in

FIGURE 1

INCOME DISPERSION ACROSS 48 STATES

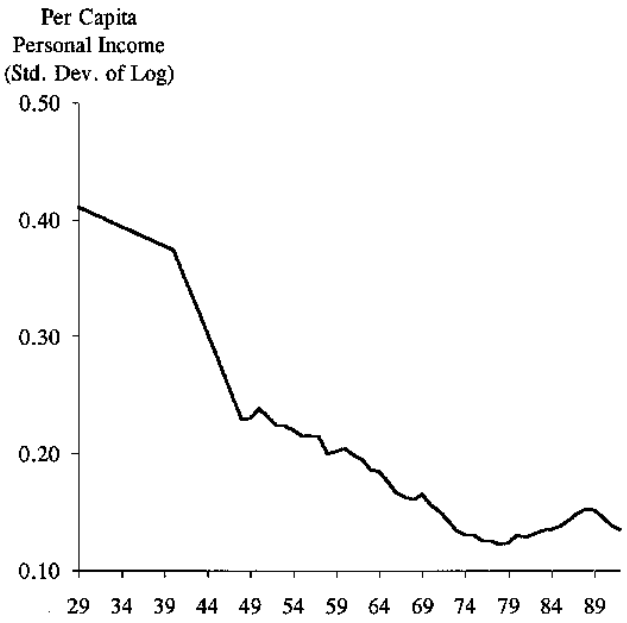
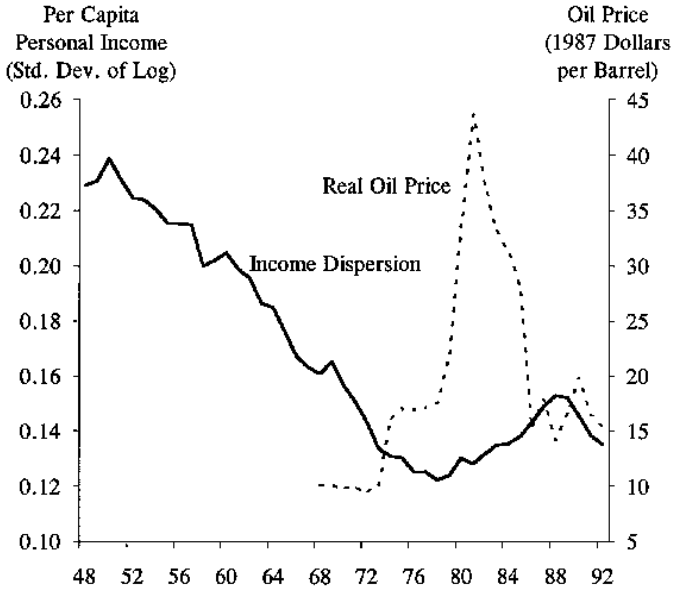


FIGURE 2

INCOME DISPERSION ACROSS 48 STATES AND OIL PRICE



1. This presents a sharp contrast with the international literature, where most studies have found that wage or income differentials tend to be relatively stable over time (Romer (1986), Lucas (1988), Quah (1993)).

2. Weights are state shares of U.S. population.

Throughout the paper, "personal income" refers to real personal income, available from the Regional Economic Information System of the U.S. Commerce Department's Bureau of Economic Analysis. Alaska, Hawaii, and the District of Columbia are omitted from the sample presented in Figure 1, and from all subsequent analysis. The geographic isolation of Alaska and Hawaii makes them unusual, and in addition data are available only starting in 1950 for Alaska, and starting in 1948 for Hawaii. Data for the District of Columbia also are problematic because of the large discrepancy between income generated in the District of Columbia and income earned by District residents.

According to some measures of dispersion, the trough was in 1979, but the standard deviation of log per capita personal income hit its low point in 1978.

3. In this section, I use the term "convergence" to describe a decline in dispersion and the term "divergence" to describe an increase in dispersion. The use of these terms should not be interpreted as implying conclusions regarding the broader issues of convergence and divergence that will be discussed in subsequent sections.

4. The oil price plotted in Figure 2 is the refiners' acquisition cost for domestic crude oil, from the U.S. Department of Energy, *Weekly Petroleum Status Report*, deflated by the GDP deflator.

energy-producing states, this increase in oil prices would have been expected to contribute to accelerating income convergence, but incomes diverged during the early 1980s. The collapse in oil prices, which is sometimes credited with generating the divergence, did not occur until 1982, four years after the divergence began. Moreover, the earlier period of sharply rising oil prices in the mid-1970s was not characterized by accelerating convergence in incomes. On the contrary, the decline in dispersion appears to have moderated somewhat during the mid-1970s. Another reason to question the oil price explanation is that omitting energy-producing states from the sample, as in Figure 3, moderates the divergence somewhat, but it still leaves a significant diverging trend through most of the 1980s.[5]

We can gain further insights into changes in dispersion during the 1980s by looking at relative per capita personal income for the individual states. Table 1 presents data on state income relative to U.S. income in 1978 and on growth in relative state income between 1978 and 1988, the period of divergence. States that had incomes 5 percent or more below the national average in 1978, and whose relative income fell more than 5 percent between 1978 and 1988 are denoted low and falling ("LF") in the right column, and states with incomes 5 percent or more above average whose relative incomes rose more than 5 percent are denoted high and rising ("HR"). These are the states that contributed significantly to the diverging trend, either positively or negatively.

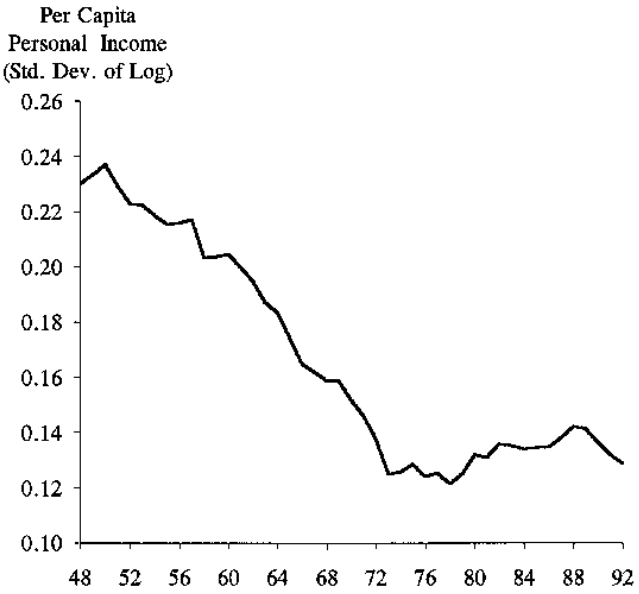
All but one of these diverging states are either energy or agricultural states, or are in the Northeast Census Region.[6] The farm and energy states tended to have low and falling incomes, while the Northeast states that contributed to the divergence had high and rising incomes.

Since we know from Figure 3 that the oil states alone do not account for the divergence, the next step is to see whether farm or Northeast states were primarily responsible for the divergence of the 1980s.[7] Figure 4 excludes farm states and Figure 5 removes the states in the Northeast Census Region from the sample. Incomes still diverge when farm states are omitted, but taking the Northeast states out of the sample yields relatively stable dispersion during the 1978 through 1988 period of divergence.[8] Indeed, without the Northeast states, dispersion appears to have stabilized around 1974. Taken together, Table 1, Figure 1, and Figure 5 suggest that a positive shock to some of the Northeast states was the most important reason that incomes diverged between 1978 and 1988. This conclusion is consistent with Wheelock and Coughlin's (1993) finding that the divergence was due primarily to strength in the high technology and producer services industries, in which several Northeast states specialize.

Several researchers have attempted to determine why Northeast states fared so well during the 1980s, with some placing the 1980s boom in the context of the subsequent deep, prolonged recession. Consistent with Wheelock and Coughlin's results, these explanations typically focus on the booming defense, high-tech, finance, and real estate sectors. Henderson (1990), for example, finds that a surge

FIGURE 3

INCOME DISPERSION EXCLUDING ENERGY STATES



5. See the Appendix Table for a list of energy-producing states.

6. The sole exception is Maryland. Lists of energy, agricultural, and Northeast states are provided in the Appendix Table.

7. In principle, the positive shock to the oil-consuming Northeast could have been the converse of the negative shock to the oil-producing states. However, if lower energy costs were the primary reason for the surge in growth in the Northeast, lower energy costs should have caused positive shocks to other regions that consume large amounts of energy. As Table 1 shows, that did not happen.

8. The time variable in a univariate regression run for the 1978–1988 period is positive even when Northeast states are excluded, but both the magnitude of the coefficient and the *t*-statistic are much smaller than they are with the 48-state sample. The coefficient on time is .0029 (t = 12.87) when all states are included, and .0004 (t = 2.13) when the Northeast states are omitted from the sample.

TABLE 1

STATE INCOME RELATIVE TO NATIONAL INCOME

	1978 Income Per Capita Relativeto U.S.	Percent Change in Relative Income Per Capita 1978–1988	Diverging States HR = High, Rising LF = Low, Falling
AL	77.9	0.6	
AR	78.3	–4.7	LF
AZ	90.8	–1.0	
CA	115.4	–2.2	
CO	103.1	–2.5	
CT	117.3	17.8	HR
DE	103.7	5.2	
FL	95.8	4.4	
GA	84.8	9.2	
IA	101.1	–13.2	
ID	87.5	–11.6	LF
IL	112.6	–4.3	
IN	96.7	–6.9	
KS	97.5	–2.3	
KY	81.9	–4.6	LF
LA	84.2	–10.1	LF
MA	104.2	19.2	
MD	107.5	9.7	HR
ME	81.4	12.9	
MI	107.4	–7.0	
MN	101.3	–1.7	
MO	94.7	–0.8	
MS	69.6	–3.3	
MT	91.3	–15.0	LF
NC	81.7	7.2	
ND	95.9	–24.2	
NE	97.9	–7.2	
NH	94.8	24.5	
NJ	114.3	17.9	HR
NM	82.2	–7.3	LF
NV	118.1	–11.3	
NY	108.9	7.4	HR
OH	99.7	–5.9	
OK	88.8	–8.9	LF
OR	101.6	–11.0	
PA	100.1	–1.0	
RI	93.7	9.3	
SC	75.9	4.7	
SD	86.3	–10.9	LF
TN	82.1	3.7	
TX	96.4	–7.7	
UT	82.5	–9.1	LF
VA	96.3	10.6	
VT	85.6	10.1	
WA	107.7	–8.3	
WI	99.0	–5.9	
WV	80.8	–10.6	LF
WY	111.2	–23.6	

FIGURE 4

INCOME DISPERSION EXCLUDING FARM STATES

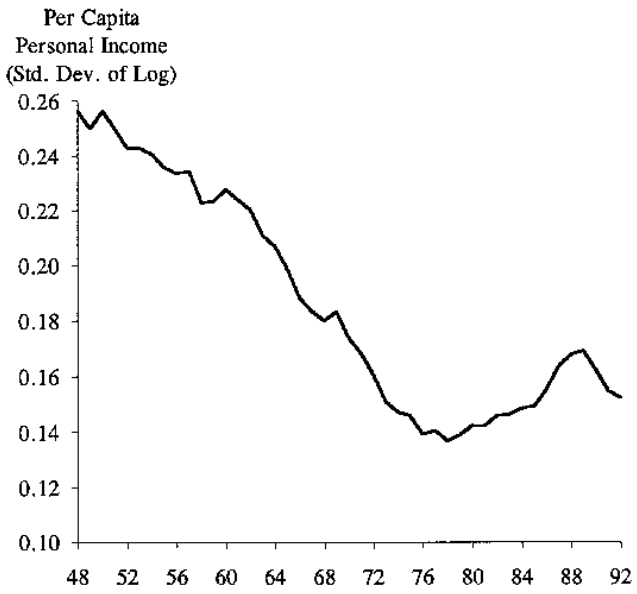
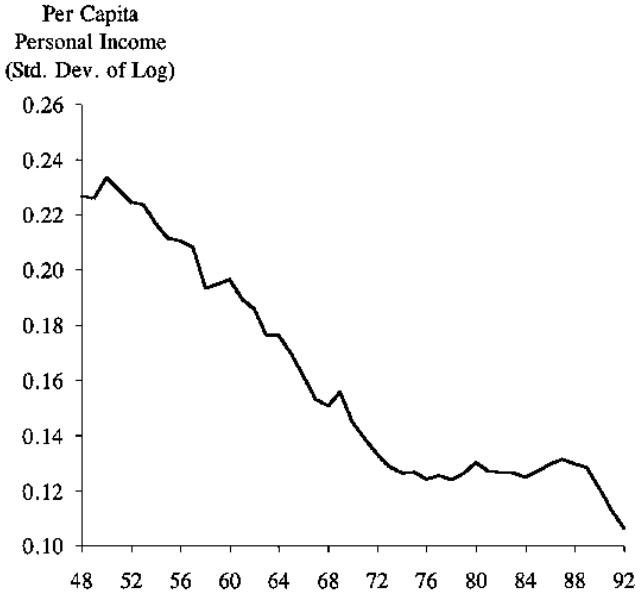


FIGURE 5

INCOME DISPERSION EXCLUDING NORTHEAST STATES



in defense-related activities coincided with the Massachusetts boom. Browne (1991) assesses the role of financial services in New England, and concludes that they probably contributed to the severity of the downturn but were not primarily responsible for it. Rosen and Wenninger (1994) point out that there is a strong correlation between total revenues of registered securities dealers and New York State income.

Blanchard and Katz (1992) find that the experience of Massachusetts during the 1980s was much more dramatic than a "typical" regional cycle. The defense and financial arguments do not explain why this episode was so atypical; many regional recessions are caused by dependence on an industry (or group of industries) that runs into trouble.

Case (1991) argues that excessive construction and real estate activity contributed to and significantly amplified the boom as well as the subsequent bust. According to this argument, sharp increases in real estate values created a boom atmosphere in which the demand for labor rose, generating increased prices and wages throughout the region's economy. Brauer and Flaherty (1992) and Rosen (1993) make arguments similar to Case's about the role of rising real estate values and general costs in exacerbating New York City's boom and bust.

There is no question that the cost of doing business in New England had risen substantially by 1987. Home prices and office rents were well above the national average, a big change from the early 1980s, when the cost of doing business in New England had been competitive with other regions. Thus, it seems plausible that a positive shock to the Northeast had an unusually large effect on income, because it was associated with an unusual run-up in the region's price level, relative to the national average.

II. SHOULD CONVERGENCE OCCUR?

According to standard, neoclassical, Solow-type growth theory, per capita incomes should converge across countries (or regions) for two reasons. First, if returns are decreasing, then additional factor inputs yield smaller increments to output in regions with higher incomes than they do in regions with lower incomes. Second, if capital and labor can move freely from one region to another, any differences in factor returns will tend to be migrated away over time. In this neoclassical view, convergence presumably would end at some point, when migration has bid away differences in factor returns across regions, and (assuming homogeneity across regions) all regions are at the same point on their production-possibilities frontier. Until this steady state is achieved, one would expect to see incomes converge.

There are, however, reasons why incomes may not converge over time. The neoclassical model relies heavily on assumptions of decreasing returns and factor mobility that may not hold. For example, Romer (1987) argues that knowledge spillovers increase the returns to human capital in regions that have large stocks of physical capital. Lucas (1988) suggests that the returns to skilled workers may be higher in locations with large concentrations of skilled workers, due to external economies of scale. In this situation, skilled workers would migrate to locations with other skilled workers, so that income differences across regions would increase over time. This result contrasts sharply with the equalizing effect of migration when workers are homogeneous or external returns to human capital are not increasing.

For these and other reasons, steady-state incomes might vary by region. Variations in family size or labor force participation yield differences in the ratio of workers to population. In this situation, per capita incomes would vary by region even if factor returns were identical. Regional variations in industry mix also could yield variations in per capita incomes, even if factor returns are equalized across regions. For example, a region specializing in high-technology production may have higher average compensation per worker than a region that specializes in low-wage service industries. That is, average returns across workers can vary by region, even if factor returns are equalized within industries and workers with comparable skills and work effort receive the same level of compensation across different regions.

In addition, people may tend to sort themselves by region in terms of the human capital they bring to the market.[9] Thus, an attorney negotiating major deals on Wall Street and an attorney writing wills on Main Street are doing two very different jobs. The knowledge they bring to the market is very different, and the returns to the skills the Wall Street attorney offers are much higher. Thus, the measured returns to labor for an attorney would be much higher on Wall Street than on Main Street, but much of the discrepancy is due to the different kinds of knowledge and skills that the two offer, rather than to a difference in the returns to lawyering that could be bid away if enough attorneys moved from Main Street to Wall Street.

Another reason why equilibrium incomes may vary across regions is that regions differ in terms of the amenities and disamenities that they offer their residents. If two regions have similar industry structures and offer similar job opportunities, but one has mild weather all year and the

9. This sorting could be driven by agglomeration economies, as in Lucas, by differences in tastes, or by some other mechanism.

other has cold winters and hot, humid summers, people would tend to sort themselves by their tastes in weather. If more people prefer mild weather year-round, land and housing costs would be higher in the mild-weather area, so that lower-valued activities would be priced out of these markets. Similar arguments could be made for other amenities, such as cultural and recreational opportunities, or disamenities, such as the risk of natural disasters.

A related argument is that per capita personal incomes may vary by region because of differences in living costs. Returns to otherwise similar workers who produce traded goods should not be higher in regions with higher costs of living, because it is unlikely that firms will be able to pass on the higher wage costs to their customers. However, if a region's industry mix, worker characteristics, or amenities result in land costs that are significantly different from land costs in other regions, workers who produce locally consumed goods (such as housing) may receive higher wages in a high-cost region than they would in a low-cost region. Equilibrium incomes therefore would vary by region if the dollar wage paid to workers in local goods industries compensates them for differences in regional amenities and costs of living.[10]

Thus, regional variations in incomes are not necessarily due to disequilibrium differences in factor returns. Steady-state incomes could vary across regions due to interregional differences in labor force participation, industry mix, worker characteristics, amenities, and costs of living. Only if the variations in factor returns are larger than these differences suggest will there be an incentive for the factor migration that tends to equalize factor returns across regions.

III. TWO MEASURES OF THE TREND IN INCOME DISPERSION

The concept of convergence is operationalized in at least two different ways in the cross-sectional literature on the dispersion of incomes among regional or national economies.[11] Convergence in the standard deviation of per capita personal income or its log (as discussed earlier and displayed in Figure 1) is known as "σ-convergence."

Another convergence concept that has been used frequently in the international literature is β-convergence. In its simplest form, β-convergence means that regions that start out the sample period with below-average incomes tend to grow faster than do regions that start with above-average incomes. That is, β is negative in an equation of the following form:

$$(1) \qquad \log Y_{iT} - \log Y_{i0} = \alpha + \beta \log Y_{i0} + \varepsilon_i$$

over the time period from 0 to *T,* where *Y* is per capita personal income and *i* subscripts denote regions. Table 2 presents results of such regressions for the states of the U.S., both for the entire sample period (when σ-convergence held) and for the 1978–1988 period (when σ diverged rather than converged). Table 2 shows that β-convergence characterized the longer time period, but did not hold for the period of σ-divergence in the 1980s.

While this suggests that periods of σ-convergence are likely to coincide with periods of β-convergence, it is important to note that σ-convergence and β-convergence are not the same. Barro and Sala-i-Martin (1991) illustrate the difference using the example of rankings of sports teams in a league or division. In their example, β-convergence can be thought of as the tendency for champions to see their performance drop off, or teams at the bottom of the ranking to revert to the middle of the pack.[12] In this context, however, σ-convergence will not occur, because σ is based on the rankings of the teams. There will always be a first-place team, a second-place team, and so on through last place.

TABLE 2

LOG DIFFERENCE REGRESSIONS

	1929–1992	1978–1988
INTERCEPT	7.889	0.488
	(34.36)	(0.44)
LOG (Y_0)	–0.694	0.023
	(–19.25)	(0.19)
ADJUSTED R^2	0.887	–0.021

NOTE: *t*-statistics are in parentheses.

10. Consistent with this, Eberts and Schweitzer (1994) find that interregional dispersion in nominal incomes is highly correlated over time with interregional dispersion in the cost of living.

11. In addition, there is a growing convergence literature that uses time series techniques. (See, for example, Quah (1993) and Carlino and Mills (1993).) Bernard and Durlauf (1994) point out that the cross-sectional and time-series approaches are appropriate for answering different questions. Since this paper was motivated by the cross-sectional relationship shown in Figure 1, it focuses on cross-sectional rather than time-series convergence.

12. Indeed, Quah (1993) and Friedman (1992) have pointed out that equations like (1) suffer from Galton's fallacy. That is, reversion to the mean suggests that β could be estimated to be negative even if the level of dispersion remains the same. Tests of σ-convergence, in contrast, do not suffer from Galton's fallacy.

In their simplest forms, both σ-convergence and β-convergence imply that steady-state per capita personal incomes are the same in all regions. However, as discussed in the section on whether convergence should occur, different regions may have different steady-state incomes. Mankiw, Romer, and Weil (1992) call the situation when each region's income is moving toward its own steady-state level "conditional convergence." Conditional convergence does not necessarily imply that σ is falling or that β estimated in (1) is negative.[13] A test for conditional convergence would include additional information to account for the difference between the average income level across regions and the individual region's steady-state income level.

To summarize the results of the convergence tests, state per capita incomes appear to have converged in both the σ and β senses during the past 45 to 60 years. The σ and β measures both suggest that the 1978 to 1988 period was different from much of the rest of the 20th century.

IV. A SHIFT IN THE LONG-RUN TREND?

The divergence of the 1980s generally has been treated as temporary, with little attention given to whether the long-run trend toward convergence in incomes among the states has changed. Given the long-term converging trend, the 1980s divergence, and the fact that theory does not provide a definitive answer about whether convergence should occur, there are three possible interpretations of the 1980s divergence:

(1) The 1980s divergence represents an anomaly in a long-term converging trend. In this case, the forces that might be expected to cause convergence continued to work throughout the 1980s, but they were offset for a time by a large shock (or set of shocks) that took several years to dissipate.

(2) Incomes have stopped converging. This could occur if differences among states' steady-state incomes are large relative to each state's deviation from its own steady-state income, so that σ is near its minimum level. In this case, dispersion should have little trend and β should be close to zero. Periods of convergence or divergence would be expected to occur as shocks temporarily pull states away from their steady-state incomes, or change their steady states.

(3) Incomes may now be diverging. Incomes could diverge because of agglomeration economies, as in Lucas (1988). Alternatively, it is possible that nonconvergence could look like a period of convergence, followed by a period of divergence.

It is relatively easy to show that the third possibility is unlikely. The Lucas argument suggests that agglomeration economies make the returns to workers who have accumulated substantial human capital higher in regions where there are other workers rich in human capital. In this case, workers rich in human capital will have an incentive to migrate to regions with large concentrations of like workers. In this way, income differences across regions can become more pronounced over time. However, this argument is inconsistent with the long period of income convergence in the United States. It is possible that there has been a structural change that has increased the extent of agglomeration economies. However, since technological advances have tended to make it less important, rather than more important, for people with large accumulations of human capital to be located near each other, this seems unlikely.

Figure 6 provides a stylized picture of relative income growth and relative income levels across states, in which convergence would be followed by divergence. In this case, income levels at the beginning of the sample period should be negatively correlated with income levels at the end of the sample period, and the rank-ordering of state incomes should have reversed itself. Instead, there is a strong positive correlation between relative per capita personal income in 1948 and relative per capita personal income in 1992. The simple correlation coefficient is 0.64, and it is significant at the 99.9 percent level. The Spearman rank correlation is even larger (0.66) and also significant at the 99.9 percent level.[14]

An End to Convergence?

Distinguishing empirically between the first and second possibilities is more difficult, but it is possible to generate some suggestive evidence. Returning to Figure 1, we see

13. Conditional convergence is defined by Mankiw, Romer, and Weil as a situation in which an equation like (1) yields a negative β only when it is augmented to include variables that determine each region's steady state income level. Carlino and Mills (1993) point out that conditional convergence implies that, when a steady state is reached, σ will be greater than zero.

14. The strong correlation between income levels at the beginning and end of the period is consistent with two possible patterns of convergence. First, if per capita personal incomes are still converging (possibility (1) above), states that started the period with high incomes would still have higher than average incomes. Second, if convergence in incomes ends because income differences reflect interregional differences in labor force and other characteristics (possibility (2)), states that started the period with higher than average incomes are likely to have higher than average steady-state incomes as well. The correlation is not consistent with a world in which convergence has eliminated interregional differences in per capita personal incomes, but neither is the fact that σ is still greater than zero.

FIGURE 6

HYPOTHETICAL PATTERN OF INCOME GROWTH ACROSS STATES

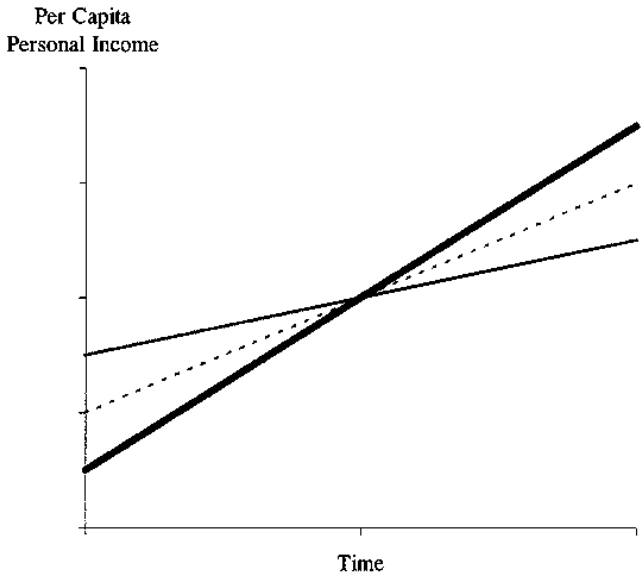


TABLE 3

LOG DIFFERENCE REGRESSIONS 1972–1992

	(1)	(2)	(3)
INTERCEPT	2.235	2.262	2.183
	(3.65)	(3.41)	(3.65)
LOG (Y_0)	–0.093	–0.181	0.049
	(–1.27)	(–1.94)	(0.57)
LOG ($n + g + d$)		–0.147	–0.046
		(–2.00)	(–0.67)
LOG (COLLEGE EDUCATION)		0.109	
		(1.44)	
LOG (HIGH SCHOOL EDUCATION)			–0.301
			(–2.69)
ADJUSTED R^2	0.013	0.065	0.159

NOTE: *t*-statistics are in parentheses.

that since about 1970, there have been roughly equal periods of increasing income dispersion and decreasing income dispersion. This "ocular regression" is confirmed by a regression of the form (1) for the 20-year period from 1972 to 1992, which is shown in the first column of Table 3. β for this regression is negative but not statistically significant, and the explanatory power of the regression is very low.[15] This suggests that it is possible that regional incomes may have gotten close to their steady-state levels.[16]

However, Mankiw, Romer, and Weil argued that similar results at the international level do not necessarily imply an end to the convergence process. Instead, omitted variables that capture steady-state differences across countries may have biased the estimation of β. That is, each country (or region) may be approaching its own (unique) steady state.

Following their methodology, I run regressions that are augmented for population growth[17] and educational attainment.[18] Other things equal, per capita incomes should grow more slowly in states with more rapid population growth,[19] and more rapidly in states with greater human capital. The second column of Table 3 shows the results for an augmented equation of this form, in which human capital is measured by the proportion of population with a college education. The augmented equation shows that β-convergence is in fact more rapid and more significant statistically, and the signs of the augmenting variables are as expected. The explanatory power of the equation, however, remains relatively poor.

Moreover, a second augmented regression, listed in the third column of Table 3, in which human capital is measured by the proportion of the working-age population that has completed high school, yields puzzling results. β essentially becomes zero, the coefficient on population growth also is essentially zero, and the human capital variable is highly statistically significant but *negative.* Nevertheless, the explanatory power of this third regression is considerably better than that of the other two.

15. Since Galton's fallacy introduces a negative bias to estimated β, it is even less likely that convergence occurred during the period.

16. This is consistent with Ram (1992), who found that the degree of dispersion in per capita personal income among U.S. states was very low.

17. Their variable is $n+g+d$, where n = rate of population growth, g = rate of technological change, and d = rate of depreciation. They assume that $g+d = 0.05$ for all regions, so $n+g+d$ varies only with the region's rate of population growth.

18. Educational attainment data are from the 1980 decennial census, *Social and Economic Characteristics.*

19. This may be more true at the country level, where migration is restricted, than at the state level, where people are free to migrate toward regions whose economies are growing.

Sahling and Smith (1983) also looked at variables that might explain differences in steady-state per capita personal incomes across states. They found that, while nominal wages remained lower in the South than in other regions during the 1970s, these differences reflected differences in human capital and the cost of living. That is, real wages in urban areas actually were higher in the South than they were in other regions. These results suggest that secular convergence may have ended in the 1970s when regional incomes were close to their steady-state levels. The second column of Table 3, in contrast, suggests that states' incomes are still approaching their steady-state levels.

Evidence from Migration Flows

If relative earnings were close to "equilibrium" levels by the 1970s, migration patterns should have changed. Differences in income levels should have motivated much of the earlier (pre-1970) migration, if migration during that period was still competing away the differences in factor returns. Since 1970, income levels should not have been strongly associated with migration flows. Instead, economically motivated migration since 1970 should have been associated with *changes* in the relative economic fortunes of different states (i.e., changes in states' relative steady-state incomes). So, for example, when Idaho suffered economic hardships during the mid-1980s, there was substantial out-migration as people sought better opportunities in states with stronger economies. More recently, Idaho's economy has been one of the strongest in the nation, and it has experienced substantial inmigration.

These propositions can be tested using census data on population migration.[20] Table 4 presents some correlations that shed light on the changing nature of economic incentives to migration. The first set of figures in Table 4 shows the simple correlation between per capita personal income and net migration flow, for various time periods.[21] It shows

20. Ideally, one would want to test the same proposition using data on capital migration, but state-to-state data on capital movements are not available.

21. The time periods are dictated by the availability of Census data. Each decennial census includes information on moves during the previous five years. Therefore, migration data are only available for the second half of each decade.

TABLE 4

CORRELATION BETWEEN PERSONAL INCOME AND NET MIGRATION
48 STATES

PER CAPITA PERSONAL INCOME	NET MIGRATION FLOW	CORRELATION	SIGNIFICANCE
1955	1955 TO 1960	0.4072	0.0041
1965	1965 TO 1970	0.1831	0.2129
1975	1975 TO 1980	–0.3790	0.0079
1985	1985 TO 1990	0.0196	0.8947

PERCENT CHANGE IN PER CAPITA PERSONAL INCOME	NET MIGRATION FLOW	CORRELATION	SIGNIFICANCE
1955 TO 1960	1955 TO 1960	–0.2385	0.1025
1965 TO 1970	1965 TO 1970	0.4353	0.0020
1975 TO 1980	1975 TO 1980	0.3870	0.0066
1985 TO 1990	1985 TO 1990	0.2370	0.1049

NOTE: Net Migration Flow is defined as the number of inmigrants minus the number of outmigrants, divided by the sum of inmigrants and outmigrants. This measure was introduced as "demographic effectiveness" by Thomas (1941), and has been used extensively in recent years by Plane (1992) and others.

that there was a statistically significant, positive correlation between income in 1955 and net migration flow between 1955 and 1960. In contrast, in each of the subsequent decades the correlation was either statistically insignificant or negative.

The second set of data in Table 4 presents the simple correlation between the *change* in per capita personal income and net migration flow. It shows that, during the late 1950s, the correlation was negative and marginally significant. That is, migrants during this early period do not appear to have been motivated by short-term changes in regional economic fortunes. In contrast, changes in relative per capita personal incomes have been positively and significantly correlated with the direction of interstate migration during two of the three 5-year sample periods since 1965. In the most recent period, from 1985 to 1990, the correlation was positive but only marginally significant.

Taken together, these sets of correlations suggest that economic factors continue to be strongly associated with migration flows within the United States. However, the nature of economic influences appears to have changed during the 1960s. Prior to 1960, differences in income *levels* were strongly and positively correlated with interstate migration flows. During that earlier period, the relationship between changes in states' relative fortunes and migration flows was weak enough that it did not show up in simple correlation statistics. These patterns are consistent with economically motivated migration from low-wage regions to high-wage regions, which is the kind of migration that should cause incomes to converge over time.

In sharp contrast, the relationship between economic factors and migration after 1965 is consistent with a world in which differences in income levels reflect differences in living costs, amenities, and so forth, so that differences in income levels are not strongly associated with migration flows. The strong correlation between income changes and migration suggests that people tended to move out of regions going through hard economic times and into prospering regions. That is, income differences between regions within the U.S. appear to be small enough that the incentives for migration can be changed significantly by shocks that affect different regions differently. This is consistent with a situation in which changes in income dispersion are driven primarily by shocks that change states' steady-state incomes or that pull the state's current income away from its steady-state level.

V. SUMMARY AND CONCLUSIONS

Within the United States, state per capita personal incomes converged during much of the twentieth century, but they diverged sharply during the 1980s. This paper has addressed the significance of both the converging and diverging periods.

The analysis presented here suggests that the most important reason for the divergence of the 1980s was a positive shock to some states in the Northeast that had an unusually large effect on the region's per capita personal income. In contrast, the energy price explanation is not consistent with either the timing of the divergence or with the fact that divergence is significant even when energy-producing states are excluded from the sample.

The analysis also sheds light on questions of future convergence. Evidence on convergence during the past 20 or so years suggests that it is plausible that states' relative income levels are close enough to their steady states that short-term deviations from steady-state incomes, together with changes in steady-state incomes, may be more important in explaining future convergence and divergence than are persistent differentials between a state's current income level and its own steady-state income level. The pace of both σ-and β-convergence was considerably slower during the past 20 years than it was earlier, and augmented regressions tend to support the possibility that differences in states' steady-state income levels can explain some of the slowdown. Moreover, evidence on changing migration patterns also is consistent with the notion that secular convergence was more or less complete by the early 1970s. During the past 25 to 35 years, differences in income levels have not been correlated with interstate migration flows, as they had been earlier. However, *changes* in relative incomes are highly and positively correlated with changes in migration flows. Thus, people tend to move from states with shrinking economies to states with growing economies, and not necessarily from low-wage to high-wage states.

These findings are not conclusive, but they do suggest considering seriously the notion that state per capita personal incomes have been close to their steady-state levels since sometime in the 1970s. The 1980s divergence resulted from a combination of sectoral shocks, including a particularly unusual shock in the Northeast, but incomes might not have converged significantly during that period even if those shocks had not occurred.

APPENDIX TABLE

AGRICULTURAL STATES	ENERGY STATES	NORTHEAST STATES
Arkansas	Kansas	Connecticut
Idaho	Kentucky	Maine
Indiana	Louisiana	Massachusetts
Iowa	Mississippi	New Hampshire
Kansas	Montana	New Jersey
Kentucky	New Mexico	New York
Minnesota	North Dakota	Pennsylvania
Mississippi	Oklahoma	Rhode Island
Missouri	Texas	Vermont
Montana	Utah	
Nebraska	West Virginia	
North Dakota	Wyoming	
Oklahoma		
Oregon		
South Dakota		
Vermont		
Washington		
Wisconsin		

NOTE: Agricultural states had at least 3 percent of their Gross State Product (GSP) generated by agriculture. Energy states had energy shares of GSP greater than or equal to 3 percent. The definition of the Northeast Region is from the Census Bureau.

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