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Why Have State Per Capita Incomes Diverged Recently?

FROM the early 1930s to the late 1970s, differences in per capita income across states narrowed substantially. By 1978, for example, one measure of state per capita income inequality had fallen to less than one-third of its 1932 value. Since 1978, however, this trend toward greater income equality across states has been sharply reversed; by 1987, state per capita income inequality had risen back to its 1966 level.

Historically, disparate regional income growth has generated political pressures to alter federal policies. For example, faster income growth in the South and West relative to the Northeast and Midwest in the 1970s led to charges that these differential growth rates were due, in part, to the distribution of federal government expenditures.[1] Yet, the Sun Belt-Frost Belt controversy arose during a period in which state per capita income growth was converging. Pressures for increased federal action in the realms of farm policy, trade policy and industrial targeting are even more likely to appear because of the increasing income divergence across states in the 1980s.[2]

This study pursues two objectives. First, it identifies the specific states responsible for the increasing inequality of state per capita income. Second, it examines whether well-known descriptions of regional growth and major economic changes can explain this new phenomenon.

INCREASING INEQUALITY — WHICH STATES ARE DIVERGING?

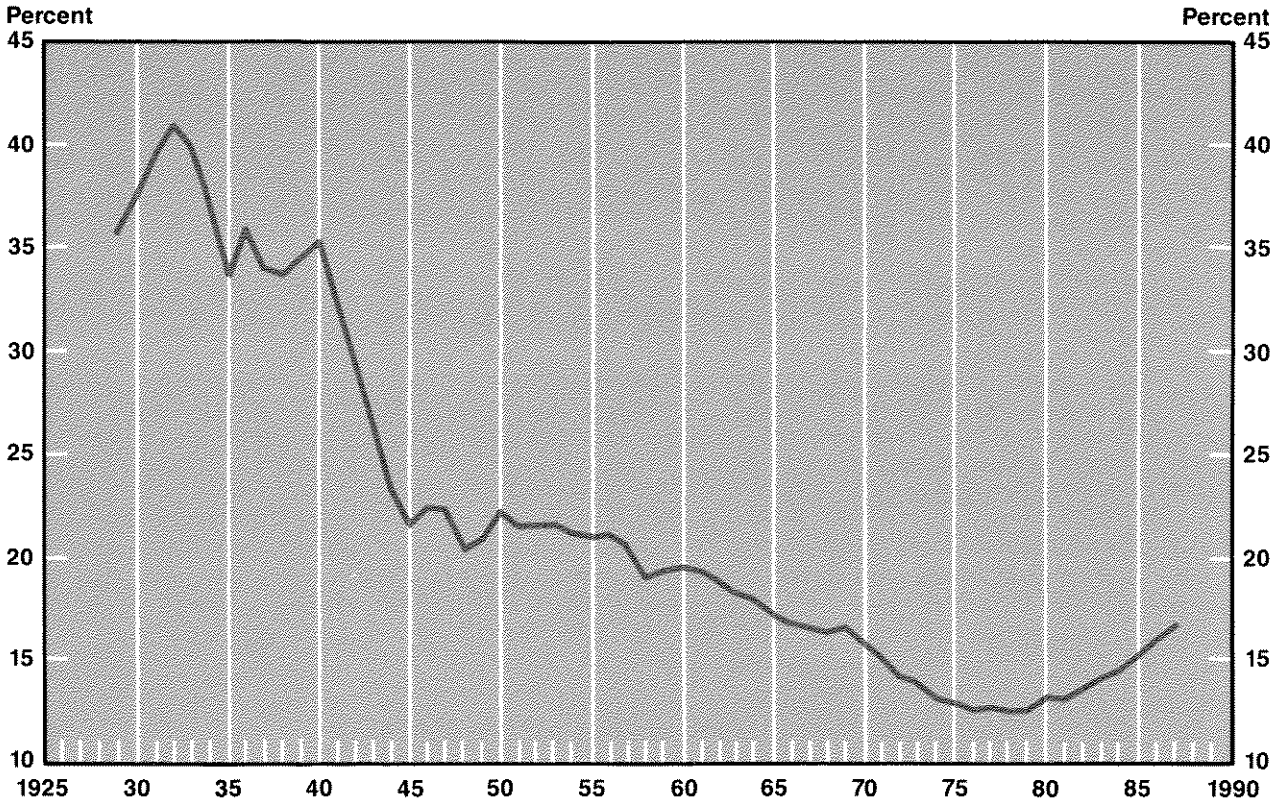
The recent sharp reversal of the 45-year trend toward lesser state per capita income inequality is shown in chart 1.[3] The measure of income inequality across states used in the chart is the annual coefficient of variation of state per capita income; its precise calculation is detailed on page 28. Income inequality across states generally declined from 1932 to 1978; since then, it has risen gradu-

[1]For example, see "The Second War Between the States" (1977) and "Federal Spending: The Northeast's Loss is the Sunbelt's Gain" (1976).

[2]Different views of the appropriate federal role can be found in Reich (1988) and Weinstein and Gross (1988).

[3]The reversal of the income inequality trend was confirmed statistically by regressing state per capita income inequality on time. To allow for the possibility of a structural break in 1978, a piecewise linear regression model was estimated. The results, based on conventional hypotheses tests, indicated a negative relationship between inequality and time until 1978 and a positive relationship thereafter.

Chart 1
Inequality of State Per Capita Income



ally, but consistently. By 1987, it had climbed back to its mid-1960s levels.[4]

Differential income growth across states has two opposing effects on state per capita income inequality measures. Income inequality is reduced when states whose per capita incomes exceed (are less than) the average for all states experience slower (faster) than average growth in income. Similarly, income inequality rises when states whose per capita incomes exceed (are less than) the average for all states experience faster (slower) than average income growth. The net effect on income inequality depends on which of these two possible growth patterns predominate. As chart 1 indicates, the former pattern predominated until the end of the 1970s, but the latter result has occurred since then.

Table 1 identifies the impact of each state on income inequality since 1978. The analysis in this table, and throughout the article, focuses on the state's *relative* per capita income — the state's per capita income expressed as a percent of the per capita income of all (continental) states. For example, if Mississippi's per capita income in 1978 was three-fourths of the average per capita income of all states for that year, its relative per capita in-

[4]Personal income consists of labor and proprietor income, dividends, interest, rent and transfer payments. Transfer payments differ from the other components in that they are not derived from current economic activity. The interstate inequality of per capita income minus transfers followed similar trends as the inequality of total per capita income; the coefficient of variation of non-transfer per capita income for the 48 states trended downward from 23.3 percent in 1946 to a minimum of 13.8 percent in 1976, then rose to 19.1 percent by 1987.

Table 1

Classification of States Based on Per Capita Income Levels and Changes

	State Per Capita Income as a Percent of State Average		
	1978	1987	Percentage Point Change 1978–87
Upwardly Divergent[1]			
Connecticut	123%	146%	23
Massachusetts	109	131	22
New Jersey	119	139	20
New Hampshire	100	119	19
New York	113	125	12
Virginia	101	113	12
Maryland	113	123	10
Rhode Island	98	107	9
Delaware	108	113	5
Florida	101	106	5
Downwardly Divergent[2]			
Idaho	93	82	−11
Montana	96	85	−11
Louisiana	88	79	−9
Utah	87	78	−9
North Dakota	99	91	−8
West Virginia	84	76	−8
Oklahoma	94	87	−7
Indiana	102	96	−6
New Mexico	87	81	−6
Texas	102	96	−6
Upwardly Convergent[3]			
Georgia	89	98	9
Maine	86	95	9
Vermont	90	98	8
North Carolina	86	91	5
Downwardly Convergent[4]			
Wyoming	117	89	−28
Nevada	124	111	−13
Oregon	107	96	−11
Iowa	107	99	−8
Michigan	113	106	−7
Washington	114	107	−7

come for 1978 would equal 75 percent. A state is judged to have had an impact on income inequality if its relative per capita income changed by 5 percentage points or more between 1978 and 1987.

The income changes of 20 states tended to increase inequality. Ten states with above-average per capita income in 1978 — Connecticut, Massachusetts, New Jersey, New Hampshire, New York, Virginia, Maryland, Rhode Island, Delaware and Florida — experienced substantially faster growth between 1978 and 1987 than the average. We call these states "upwardly divergent." There were 10 states with below-average per capita income — Idaho, Montana, Louisiana, Utah, North Dakota, West Virginia, Oklahoma, Indiana, New Mexico and Texas — that experienced substantially slower than the average growth. We call these states "downwardly divergent."

We have also identified 10 states whose income changes have tended to reduce inequality. Four of them — Georgia, Maine, Vermont and North Carolina — were states whose per capita incomes were below the average across states in 1978, but who have grown faster than this average since then. These states are called "upwardly convergent."

Table 1 cont'd.

No Substantial Change[5]			
Illinois	118	114	−4
Ohio	105	101	−4
South Dakota	91	87	−4
Kentucky	86	83	−3
Mississippi	74	71	−3
Nebraska	103	100	−3
Arkansas	81	79	−2
Wisconsin	104	102	−2
Kansas	105	104	−1
Pennsylvania	105	104	−1
Alabama	82	82	0
Colorado	109	110	1
Missouri	100	101	1
Arizona	95	97	2
California	121	123	2
South Carolina	80	82	2
Tennessee	86	88	2
Minnesota	106	110	4

[1]States with above-average per capita income in 1978 and with a 5 or more percentage-point increase in per capita income as a percent of the state average. For Rhode Island, a state with below-average per capita income in 1978 and above-average per capita income in 1987, the rise in relative income resulted in the state's income absolutely further from the average in 1987 than in 1978.

[2]States with below-average per capita income in 1978 and with a 5 or more percentage-point drop between 1978 and 1987 in state per capita income as a percent of state average. For Indiana and Texas, states with above-average income in 1978 and below-average income in 1987, the drops resulted in the states' being absolutely further from average per capita income in 1987 than in 1978.

[3]States with below-average per capita income in 1978 and with a 5 or more percentage-point increase between 1978 and 1987 in state per capita income as a percent of the state average.

[4]States with above-average per capita income in 1978 and with a 5 or more percentage-point decline between 1978 and 1987 in state per capita income as a percent of the state average. For Wyoming, Oregon and Iowa, states with above-average per capita income in 1978 and below-average per capita income in 1987, the drop resulted in per capita income closer to the state average in 1987 than in 1978.

[5]States whose absolute percentage-point change in per capita income as a percent of the states was less than 5 percent between 1978 and 1987.

Six states — Wyoming, Nevada, Oregon, Iowa, Michigan and Washington — were "downwardly convergent." These states, whose per capita incomes exceeded the average across states in 1978, but who have grown slower than this average, also contributed to reduced inequality. Of all the states, Wyoming is the hardest to categorize. Between 1978 and 1987, it experienced the largest percentage point decline in relative per capita income of the 48 states. This 28-point decline dropped Wyoming from an above-average income level in 1978 to below-average by 1987. If the analysis had focused on changes from 1984 to 1987, Wyoming would have been labeled as downwardly divergent rather than downwardly convergent.

Finally, 18 states had relative per capita incomes that changed less than 5 percentage points between 1978 and 1987. These states had little impact on the recent changes in inequality.

To provide a geographic overview of the results presented in table 1, a map is presented. As the map reveals, states experiencing relatively rapid per capita income growth are, without exception, Atlantic Coast states. Since these states tend to have per capita incomes above the average across states, their rapid growth tends to contribute to increasing inequality. On the other hand, states experiencing relatively slow per capita income growth are scattered across the remainder of the continental United States. The following analysis examines some of the popular descriptions of regional growth and some major economic changes to see if they can explain this rising inequality.

Measuring Income Inequality

The measure of income inequality used in this article is the coefficient of variation of annual state per capita incomes across the 48 continental states (INEQ).[1] The coefficient of variation is the standard deviation of a series divided by its mean. For each year, INEQ measures the degree of dispersion of state per capita incomes about the mean state per capita income (MEAN). With each state weighted equally, MEAN is calculated as follows:

$$MEAN = \sum_{i=1}^{48} SPCI_i / 48,$$

where i = subscript denoting the individual states and SPCI = state per capita income.

Thus, the INEQ is calculated as follows:

$$INEQ = [\{ \sum_{i=1}^{48} (SPCI_i - MEAN)^2 / 47 \}^{1/2}] / MEAN.$$

A larger value of INEQ indicates greater variation between state per capita incomes and, thus, greater inequality.[2] If per capita income rose (fell) in a state with below-average per capita income or declined (rose) in a high per capita income state, other things equal, INEQ would decline (increase).[3]

Unlike the standard deviation, the coefficient of variation used in computing INEQ reflects dispersion relative to the mean and can be used to compare the degree of inequality in different years with differing means. For example, if per capita income in each state doubled between 1970 and 1980, the standard deviation for 1980 would be twice that of 1970. The coefficient of variation, however, would show no change since it is standardized by the mean per capita income.

For the coefficient of variation to be an unbiased measure of inequality, the underlying data must be normally distributed.[4] Using the Shapiro-Wilk (1965) statistic, the state per capita income series was tested for normality for each year. The null hypothesis, that the state per capita income data are a random sample from a normal distribution, could not be rejected at the 5 percent level for any years in the postwar period.

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[1]Data for the continental, rather than the entire, United States are used because no consistent income series is available for Hawaii or Alaska for the postwar period.

[2]Because state income data do not correct for cost-of-living differences among states, the inequality measure may not accurately reflect the real variations in per capita income levels among states. No reliable state cost-of-living data exist to make such adjustments. A related issue is interstate differences in price changes over time. If states with above-average per capita income in 1978 experienced substantially higher inflation between 1978 and 1987 than low-income states, the rise in inequality could be due to these differences with no change in the inflation-adjusted distribution of per capita income. Price deflators for individual states are unavailable; however, regional deflators show little difference in inflation between 1978 and 1987. Using a December 1977 base, the consumer price index (for all urban consumers) for November 1987 was 186.2 for the Northeast, 184.7 for the North Central Region, 185.1 for the South and 187.4 for the West.

[3]A related measure of income inequality, the standard deviation of the ratio of regional to national per capita income was used in Browne (1980) and Ray and Rittenoure (1987). The simple correlation between INEQ and the standard deviation of the ratio of state to national per capita income was 0.999 in the 1948–87 period. Williamson (1965) p. 11, also used a related inequality measure: a population-weighted coefficient of variation of per capita income; the measure is computed identically to INEQ except each region's squared deviation from the mean is multiplied by its share of the national population. For the 1946–87 period, a correlation of 0.985 was found between INEQ and a population-weighted coefficient of variation using state per capita income.

[4]See Yotopoulos and Nugent (1976), pp. 242–43.

THE SHIFT TO THE SUN BELT

The shift of industrial activity from the nation's Frost Belt to the Sun Belt contributed to the lessened inequality during the 1970s. Businesses, particularly manufacturing, migrated to the Sun Belt from the Frost Belt for various reasons, including lower wage rates.[5] Since manufacturing wages are

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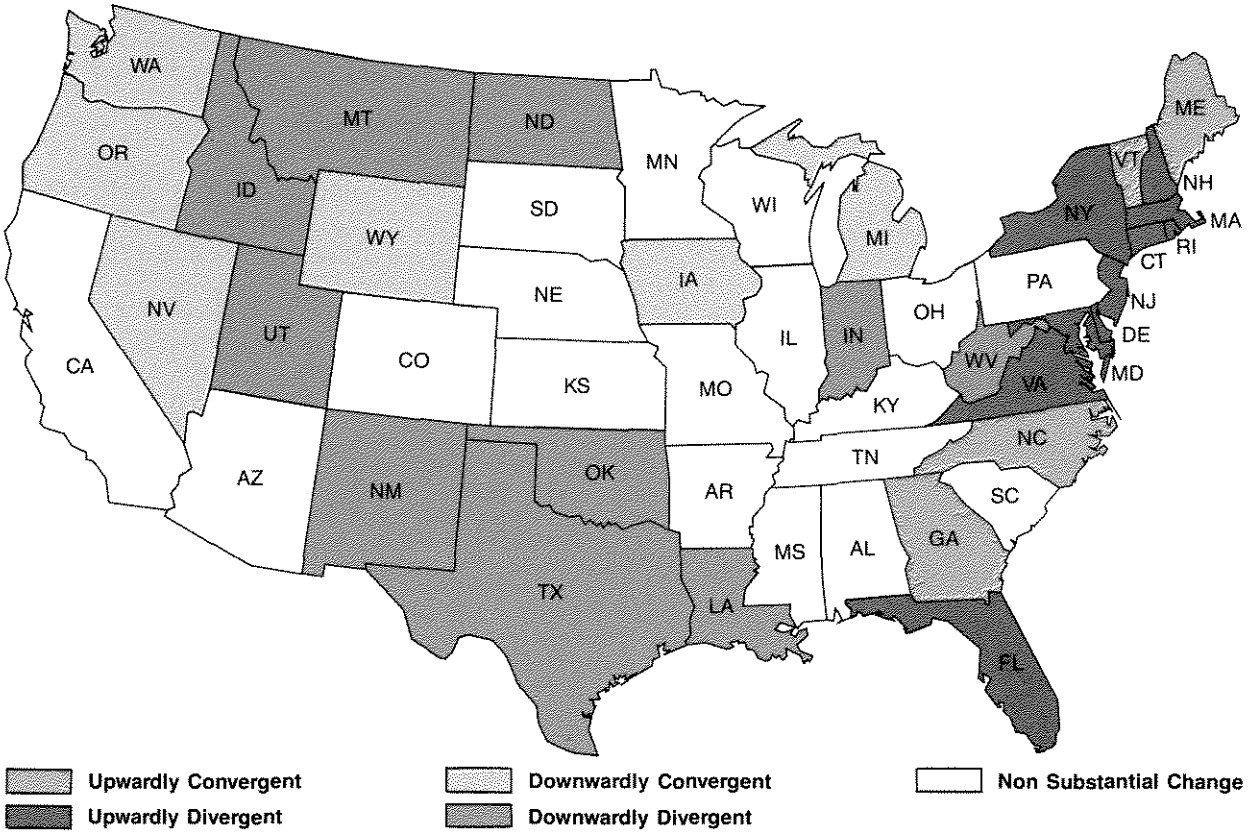
[5]See Crandall (1986), pp. 124–27, for a brief survey of empirical research documenting and explaining manufacturing's shift to the Sun Belt.

States Classified by 1978-87 Per Capita Income Change



well above the average wage of all industries in all regions of the nation, this shift of labor demand from higher-wage to lower-wage states produced higher relative growth in per capita income in the lower-income states and relatively lower income growth in the higher-income states.[6] For example, using one listing of Frost Belt and Sun Belt states (see table 2), the Sun Belt's share of (continental) U.S. manufacturing employment increased from 34.4 percent in 1969 to 39.0 percent in 1978, while the Frost Belt's share decreased from 51.3 percent to 46.2 percent. During the same period, average relative per capita income for the Sun Belt states increased from 91.2 percent in 1969 to 92.6 percent in 1978; in the Frost Belt states, it fell from 112.4 percent in 1969 to 106.3 percent in 1978.

This shift has continued in the last 10 years. The Sun Belt's share of manufacturing employment increased from 39.0 percent in 1978 to 43.7 percent in 1987, while the Frost Belt's share decreased from 46.2 percent to 41.1 percent. Although the shift, by itself, tends to reduce income inequality, the actual per capita incomes for the two regions have not continued to converge over this period. While the average per capita income for the Sun Belt states as a percentage of the average income for all states rose slightly from 92.6 percent to 93.1 percent between 1978 and 1987, it jumped from 106.3 percent to 111.1 percent in the Frost Belt states.

One reason why per capita incomes in the Frost Belt and the Sun Belt have stopped converging since 1978 is that the shift of manufacturing activity to the Sun Belt is less widespread than in previous decades; since 1978, manufacturing trends in many states differed sharply from that of their region. For example, the Frost Belt's share of manufacturing workers continued to decline after

[6]In 1987, for example, average weekly earnings for production workers in the nation's manufacturing sector was $406, 30 percent higher than the private-sector average.

Table 2

Impact of Sun Belt and Frost Belt States on Inequality

Sun Belt States		Frost Belt States	
Alabama	— No Substantial Change	Maine	— Upwardly Convergent
Arizona	— No Substantial Change	New Hampshire	— Upwardly Divergent
Arkansas	— No Substantial Change	Vermont	— Upwardly Convergent
Delaware	— Upwardly Divergent	Massachusetts	— Upwardly Divergent
California	— No Substantial Change	Rhode Island	— Upwardly Divergent
Florida	— Upwardly Divergent	Connecticut	— Upwardly Divergent
Georgia	— Upwardly Convergent	New York	— Upwardly Divergent
Kentucky	— No Substantial Change	New Jersey	— Upwardly Divergent
Louisiana	— Downwardly Divergent	Pennsylvania	— No Substantial Change
Maryland	— Upwardly Divergent	Ohio	— No Substantial Change
Mississippi	— No Substantial Change	Indiana	— Downwardly Divergent
New Mexico	— Downwardly Divergent	Illinois	— No Substantial Change
North Carolina	— Upwardly Convergent	Michigan	— Downwardly Convergent
Oklahoma	— Downwardly Divergent	Wisconsin	— No Substantial Change
South Carolina	— No Substantial Change		
Tennessee	— No Substantial Change		
Texas	— Downwardly Divergent		
Virginia	— Upwardly Divergent		
West Virginia	— Downwardly Divergent		

SOURCE: Weinstein, Gross and Rees (1985) and table 1.

1978, but manufacturing in most New England states grew as fast as, or faster than, the nation. Manufacturing job shares remained constant between 1978 and 1987 in Maine, Massachusetts and Connecticut, while rising in New Hampshire and Vermont. The rapid growth of high-technology manufacturing between 1978 and 1984, particularly computer- and defense-related production, was largely responsible for the rapid growth of per capita income in New England.[7] This growth contributed to the Frost Belt's relatively rapid income growth and the nation's increasing income inequality since 1978. As table 2 shows, the higher-income states of Connecticut, New Hampshire and Massachusetts are classified as upwardly divergent.

Despite a sharp loss of manufacturing jobs since 1978, New York, New Jersey and Rhode Island have had relatively rapid per capita income growth, contributing to the rising inequality. In these states, rapid income growth was fueled by the expansion of construction and services, especially health, business and financial services.[8]

At the same time, some Sun Belt states have not shared in that region's industrial expansion. Manufacturing employment from 1978 to 1987 grew substantially slower in West Virginia and Louisiana and no faster in Kentucky, Maryland, Oklahoma and Tennessee than it did in the nation. The slower growth in these states may have stemmed, in part, from their specialization in energy-related industries, an issue discussed later in this article. As table 2 indicates, Louisiana, Oklahoma and West Virginia were among the downwardly divergent Sun Belt states.

To summarize, manufacturing activity has continued to shift from the Frost Belt to the Sun Belt states in the 1980s, but not as widely as in previous decades; in fact, a number of states in both

[7]See Bradbury and Browne (1988). Manufacturing, however, was not entirely responsible for New England's per capita income growth, especially since 1985. Rapid growth of earnings in construction and in service-producing industries (especially finance, insurance, real estate, medical and business services) combined with relatively slow population growth to spur New England's expansion.

[8]U.S. Department of Commerce (1987), p. 2, and Ray and Rittenoure (1987) p. 244, briefly discuss sources of growth in Mid-Atlantic States. Gross and Weinstein (1988) argue that the rapid growth of the New England and Mid-Atlantic economies in the 1980s is at least partially due to a rise in federal spending in those regions, particularly grants-in-aid and procurement. The slower economic growth of some Sun Belt states, meanwhile, allegedly stems from a decline in the federal expenditures they receive.

"belts" have experienced manufacturing growth counter to that of their region as a whole. Thus, rather than continuing to converge as they had in the early and middle 1970s, the gap between per capita incomes in the Frost Belt and Sun Belt states has widened since 1978.

THE BI-COASTAL ECONOMY

According to a study released in 1986 by the Democratic staff of the Joint Economic Committee of the U.S. Congress, national economic growth between 1981 and 1985 was concentrated in states on the East Coast and in California.[9] The rapid expansion of these states relative to the nation's interior states led to the characterization of the United States as a bi-coastal economy, despite the absence of Oregon and Washington from the list of fast-growing states. For example, the study noted that real earnings grew at a 4 percent rate in the coastal states during the 1981–85 period, compared with a 1.4 percent rate in the non-coastal states.

Does the bi-coastal economy, which is primarily a description rather than an explanation of the pattern of growth, provide insights into the increasing inequality of state per capita income? Two questions must be answered affirmatively. First, are the bi-coastal states experiencing more rapid growth of per capita income? The answer to this question is "yes." Table 3 lists the bi-coastal states and their per capita income performance for 1978–87. Of the 16 bi-coastal states, 14 grew substantially faster in per capita income than average. California, the sole West Coast state, and South Carolina experienced no substantial change in their relative per capita income growth.

Second, did these rapidly growing states also have above-average per capita incomes? If so, the rapid growth causes their per capita income to rise further above the average, thus, increasing state income inequality. Of the 14 states with rapidly growing per capita income, 10 are classified as divergent; only four of these states are convergent. In fact, the 10 divergent states account for all the upwardly divergent states in the continental United States and the four convergent states account for all the upwardly convergent states. Thus, relatively rapid East Coast income growth was a primary influence in increasing the inequality of state per capita income.

Table 3
Impact of Bi-Coastal States on Inequality

California	— No Substantial Change
Connecticut	— Upwardly Divergent
Delaware	— Upwardly Divergent
Florida	— Upwardly Divergent
Georgia	— Upwardly Convergent
Maine	— Upwardly Convergent
Maryland	— Upwardly Divergent
Massachusetts	— Upwardly Divergent
New Hampshire	— Upwardly Divergent
New Jersey	— Upwardly Divergent
New York	— Upwardly Divergent
North Carolina	— Upwardly Convergent
Rhode Island	— Upwardly Divergent
South Carolina	— No Substantial Change
Vermont	— Upwardly Convergent
Virginia	— Upwardly Divergent

SOURCE: U.S. Congress (1986) and table 1.

While explanations for the relatively rapid growth of income in the coastal states are speculative, explanations of why income growth in interior states lagged behind are more precise.[10] Falling energy prices and the agricultural crisis are two frequently cited reasons for the below-average performance.

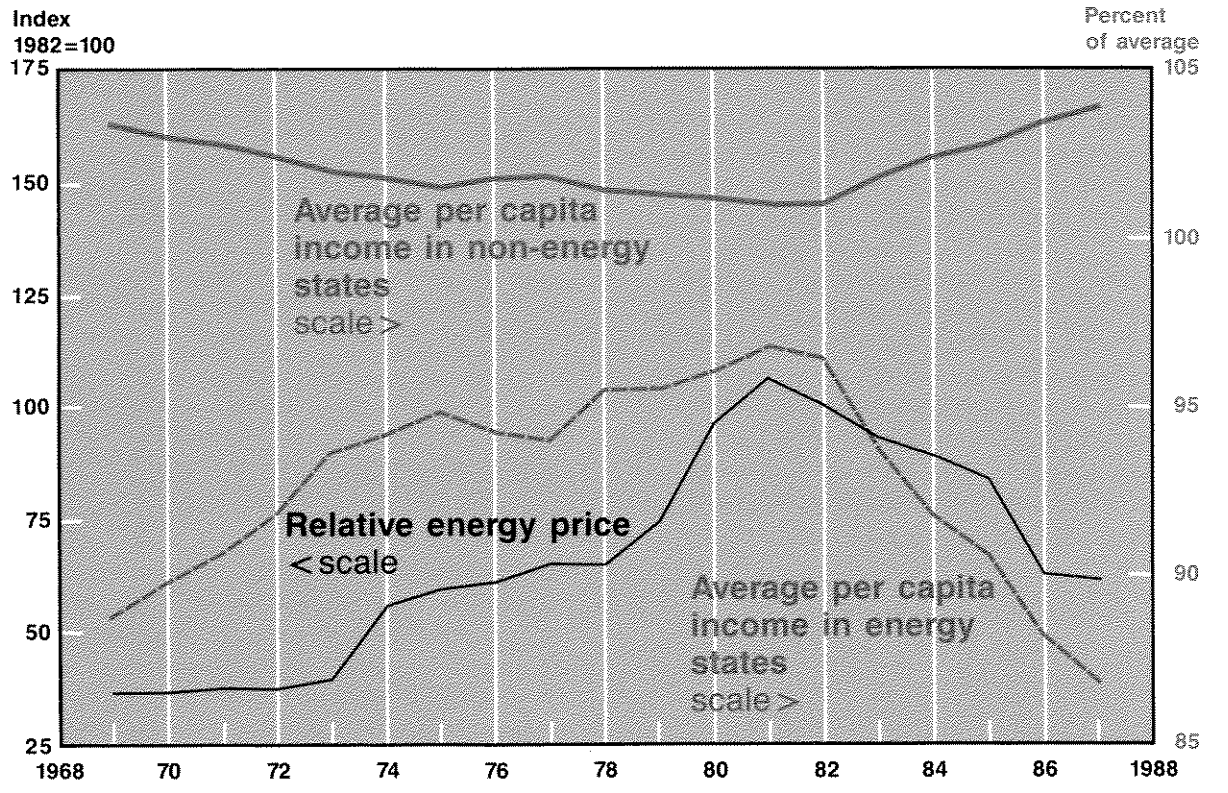
The Influence of Falling Energy Prices

The economic growth of states endowed with substantial energy resources tends to be directly related to energy prices, while the economic

[9]The study, *The Bi-Coastal Economy*, was released in July 1986 by the Joint Economic Committee of the U.S. Congress. See U.S. Congress (1986).

[10]The Joint Economic Committee study suggested a number of reasons for the uneven pattern of regional growth during the first half of the 1980s. The study suggests that "a central cause is trade and the current massive imbalance in trade that exists between the United States and its trading partners" that disproportionately affects interior states. U.S. exports of both agricultural and nonagricultural commodities had declined to some extent, according to the authors, because of increased competition from Third World nations attempting to earn foreign currency to pay interest on their loans. Also, increased competition from imported manufactured goods in domestic markets was claimed to be partially responsible for the observed pattern of regional growth. The study's final explanation relates to the strong job growth in the service industry, particularly in firms engaged in importing, advertising, financing and selling foreign-made goods. Such industries are strongly concentrated on the coasts, according to the study, and their growth helped boost the coastal states.

Chart 2
Relative Energy Prices and Relative Per Capita Income in Energy and Non-Energy States



growth of energy-poor states tends to be inversely related.[11] As chart 2 shows, energy prices relative to the general price level rose rapidly from 1973, peaked in 1981, then fell through 1987.[12] If energy-rich states are also generally lower-income states, the decline in energy prices in the 1980s has contributed to the increasing interstate inequality by slowing income growth in these states relative to those that purchase most of their energy resources from out-of-state sources.

The evidence supports this explanation. As chart 2 shows, relative per capita income in energy states generally followed the rise and fall of energy prices, while the relationship was an inverse one

[11]See Manuel (1982) and Brown and Hill (1987) for empirical studies documenting the relationship between energy prices and state economic growth. Miernyk (1977) and Manuel (1982) discuss why energy prices and state economic growth are linked. As they rise, energy costs become an increasingly important factor in determining where to locate an energy-intensive industry. Such relocation tends to shift employment opportunities from energy-poor regions to energy-producing states. Higher energy prices may also stimulate greater investment in energy production and exploration, increasing jobs in energy-producing states. Although profits from relocating manufacturing firms are likely to be distributed to owners throughout the nation, the increased employment tends to increase income in energy-producing states. In contrast, energy-poor states are burdened with higher costs for fuel and inputs in which energy costs are an important component. When energy prices fall, the advantages shift to states that heavily import oil rather than produce it.

[12]Relative energy prices in this article are indicated by the producer price index for fuels, related products and electric power divided by the GNP implicit price deflator for the private business sector. The oil embargo in 1973–74 contributed directly to the price increases for petroleum and indirectly to price increases for other energy sources as energy users searched for oil substitutes. Relaxation of price controls during the period contributed to the price increases of natural gas. The easing of energy prices in the current decade reflects a worldwide increase in global oil supplies as international oil cartels are unable to agree on production quotas. Also, heavy investment to increase energy efficiency by car makers, businesses and households has caused the quantity of energy demanded to grow substantially slower than the rest of the nation's economy, according to Schmidt (1988).

Table 4

Impact of Energy-Producing States on Inequality

Wyoming	— Downwardly Convergent
West Virginia	— Downwardly Divergent
Oklahoma	— Downwardly Divergent
Louisiana	— Downwardly Divergent
Kentucky	— No Substantial Change
Texas	— Downwardly Divergent
North Dakota	— Downwardly Divergent
New Mexico	— Downwardly Divergent
Colorado	— No Substantial Change
Montana	— Downwardly Divergent
Utah	— Downwardly Divergent

NOTE: Energy-producing states are those in which earnings from oil and gas extraction and coal mining produced at least 3 percent of the state's total earnings in 1981. States are ordered from those with the highest to the lowest percentage.
SOURCE: table 1.

for the other states.[13] Table 4 lists the 11 energy states in the continental U.S. in which earnings from oil and gas extraction and coal mining produced at least 3 percent of the state's total earnings in 1981, the year in which energy prices peaked and oil and gas extraction and coal mining provided its largest share of total U.S. earnings in the postwar period.[14] The energy states are listed in descending order according to the proportion of their earnings derived from oil and gas extractions and coal mining, ranging from Wyoming with 18.6 percent to Utah with 3.1 percent.

In 1969, before the sharp rise in energy prices, per capita income in the energy states averaged 88.7 percent of that for all 48 continental states. This proportion rose to 95.4 percent by 1978 and peaked at 96.7 percent by 1981. By 1987, after energy prices had declined substantially, the average per capita income in energy states declined to 86.8 percent of the average of all states.

Of the 11 energy states, all but Kentucky, Colorado and Wyoming were classified as downwardly divergent (see table 4).[15] In half of these eight downwardly divergent states (Oklahoma, New Mexico, Louisiana and Texas), relative per capita income rose from 1978 through the early 1980s, then fell sharply in subsequent years, following energy price trends. Wyoming also exhibited this pattern of growth: its relative per capita income grew to 121 percent of the state average by 1980, remained high in 1981, then plummeted to 89 percent by 1987. Although classified as downwardly convergent, Wyoming's per capita income fell below the national average in 1984 and, thus, has contributed to the greater inequality of state income since that year.

In the remaining downwardly divergent energy states (West Virginia, North Dakota, Utah and Montana), relative per capita income trended downward throughout the 1978–87 period. Although the fall in energy prices undoubtedly contributed to their slowing after 1981, their sluggish income growth in previous years suggests that other factors were at work as well.

The importance of the energy price decline as a contributor to increasing interstate inequality can be seen more clearly by considering the list of downwardly divergent states in table 1. Energy states account for eight of the 10 downwardly divergent states. In addition, Wyoming, has contributed to increasing inequality since 1984.

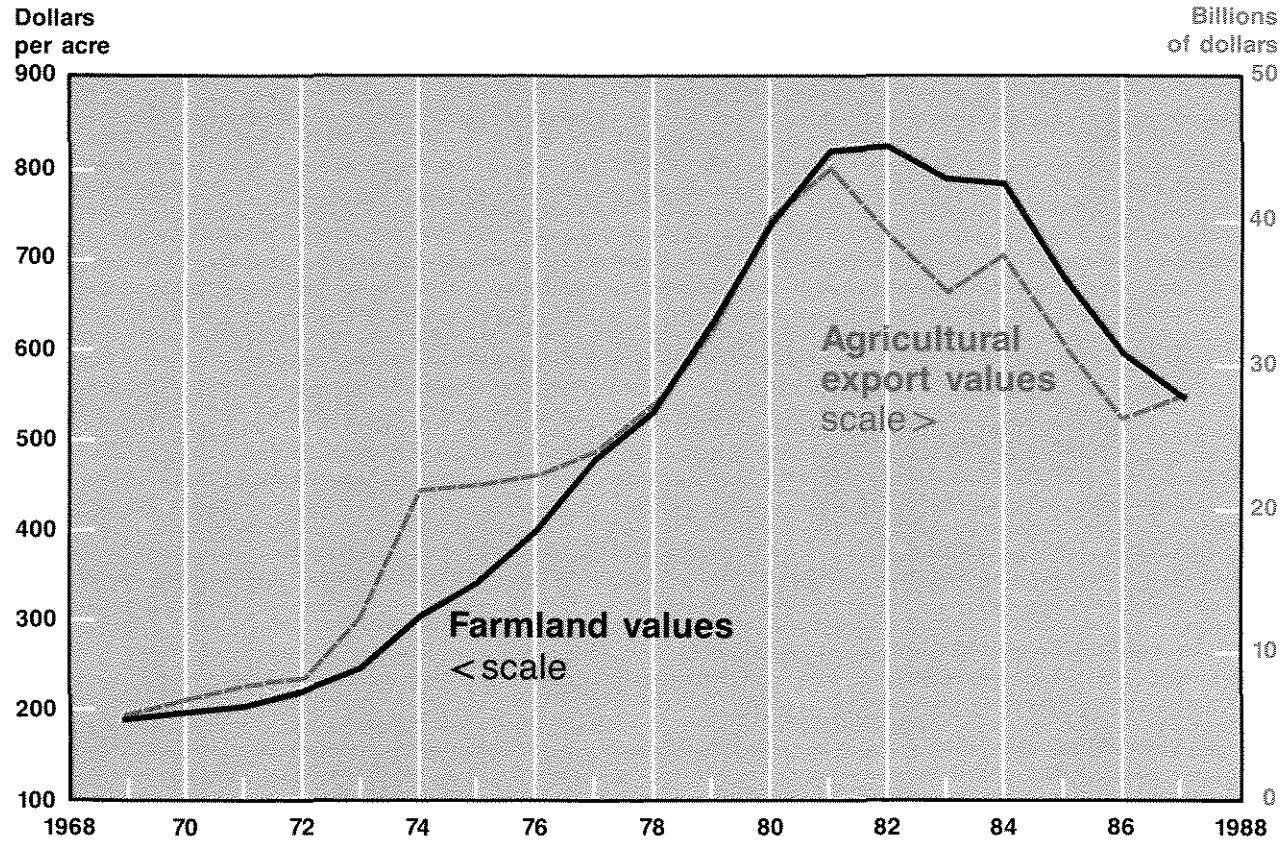
None of the states with substantial upward movement of relative per capita income were energy-rich states. Instead, these states were heavy importers of energy resources who generally benefited from the cheaper energy resources in the 1980s. Since most states with substantial post-1978 income growth had above-average per capita incomes, the fall in energy prices also tended to increase inequality by boosting their growth further above the average. Thus, the de-

[13]In the 1947–87 period, the correlation between relative energy prices and the average relative per capita income of energy states is 0.54, significantly different from zero at the 1 percent level. The correlation of relative energy prices and the relative per capita income of non-energy states, −0.54, is identical in absolute value, but negatively signed. This correlation is also significant at the 1 percent level.

[14]The validity of this classification is suggested by the substantial overlap between this list of energy states and those suggested in two previous studies. Nine of the 11 states shown in table 4 were among the 10 continental U.S. states with a ratio of energy production to energy consumption greater than unity in 1976 (Corrigan and Stanfield, 1980). Eight of the 11 states identified as energy states in our study were among the nine continental U.S. states in which oil-price declines were associated with declines in total state employment in Brown and Hill (1988).

[15]Research by Hunt (1987) suggests that Colorado's economy was not adversely affected by declining energy prices because of its diversified economic base which captured enough beneficial effects of oil price declines to offset the negative effects.

Chart 3
Economic Indicators of U.S. Agriculture



cline in energy prices was an important factor in increasing inequality in the 1980s.[16]

The Influence of the "Farm Crisis"

The first half of the 1980s has been accompanied by a widely publicized economic deterioration of the nation's agricultural sector.[17] Chart 3 shows two symptoms of the so-called farm crisis. The value of both the nation's farm exports and farmland grew rapidly during the 1970s but declined during the current decade.

A decline in the farm sector affects non-farm sectors directly linked to agriculture. These include suppliers of fertilizer and farm equipment as well as firms that transport, process and market agricultural products. Less directly, a decline in farming and agribusiness could adversely affect other sectors as well, such as those providing services to agricultural workers.

A decline in the nation's agricultural sector would most adversely affect state income in agriculture-intensive states. One measure of this intensiveness is the proportion of total state earnings accounted for by farm labor and proprietor earnings.[18] Table 5 displays the 12 states that derived at least 4 percent of their earnings from farms in 1981, the most recent peak in both agricultural exports and farmland values. North Da-

[16]Ray and Rittenoure (1987) found that declining energy prices contributed to the increasing inequality of regional per capita income in the 1980s.

[17]See Petrulis et al. (1987) for a discussion of the reasons for the farm crisis.

[18]Since the purpose of this analysis is to assess the possible effects of the farm sector downturn on state per capita personal income, farm labor and proprietor earnings (a component of personal income) is a more appropriate measure of farm income than net farm income. While real net farm income is a better measure of farm profitability, it includes corporate income, which is excluded from the personal income series.

Table 5
Impact of Farm States on Inequality

South Dakota	— No Substantial Change
North Dakota	— Downwardly Divergent
Iowa	— Downwardly Convergent
Nebraska	— No Substantial Change
Idaho	— Downwardly Divergent
Arkansas	— No Substantial Change
Montana	— Downwardly Divergent
Kentucky	— No Substantial Change
Minnesota	— No Substantial Change
Wisconsin	— No Substantial Change
Vermont	— Upwardly Convergent
Kansas	— No Substantial Change

NOTE: Farm states are those in which 4 percent or more of total 1981 state earnings were derived from farming. States are ordered from those with the highest to the lowest percentage.
SOURCE: table 1.

kota and South Dakota were the states most reliant on farming, with 11.9 percent and 15.1 percent of their total earnings directly derived from agriculture.

Average per capita income has declined in farm states relative to nonfarm states since 1978. Between 1978 and 1987, relative per capita income in farm states dropped from 97 percent of the average to 93 percent. During the same period, the average of relative per capita income in all other states rose from 101 percent to 102 percent.

Despite this divergence, few farm states contributed substantially to interstate income inequality. As table 5 shows, only three of the 12 farm states — Idaho, Montana and North Dakota — are classified as downwardly divergent. On the other hand, farm states account for two of the 10 convergent states. Relative per capita income also fell substantially in Iowa, a state with above-average per capita income in 1978, and per capita income rose in Vermont, a state with below-average per capita income in 1978. Little change in relative per capita income occurred in the remaining seven farm states. Overall, the impact of the farm crisis on the recent increase in inequality appears minimal.

CONCLUSION

The 45-year downward trend in inequality ended in the late 1970s. Twenty states, evenly divided between below-average and above-average per capita income states, are primarily responsible for the increasing inequality. All states with above-average per capita income and relatively rapid income growth are located on the Atlantic Coast. The states with below-average per capita income and relatively slow growth are scattered throughout the nation's interior.

The Sun Belt-Frost Belt description of regional growth has limited success in explaining this phenomenon. The shift of manufacturing activity from the Frost Belt to the Sun Belt, which contributed significantly to the narrowing of regional income differentials in the 1970s, has continued in the 1980s, but has affected fewer states. Indeed, in recent years, manufacturing has grown relatively rapidly in some New England states, while growing no faster than the national average in several Sun Belt states.

The description of the U.S. economy as a bi-coastal economy with rapidly growing coastal and slowly growing interior states provides a better insight into the location of states responsible for the rising income inequality, but not necessarily the reasons for this result. The relatively poor performance of the interior states has been attributed to various problems related to agriculture as well as to falling energy prices. The agriculture crisis has little explanatory power. Although the agricultural sector has weakened in the 1980s, farm states account for only three of the 10 downwardly divergent states.

On the other hand, declining energy prices have been a major factor in increasing interstate income inequality. Energy states account for eight of the 10 downwardly divergent states. Another energy state, Wyoming, has contributed to increasing income inequality since 1984.

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