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Changes in State PCPI Rankings

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Abstract. Research on convergence of state per capita personal income (PCPI) generally finds convergence through 1990. In recent years, the data suggest convergence stopped and it may have reversed. This study finds that the conclusion depends on the way states are grouped. Analysis of quintiles based on 1950 PCPI shows convergence until 1990 and a relatively constant dispersion thereafter. Quintiles based on 2012 PCPI show substantial divergence after 2000. This paper also analyzes the changes in state PCPI ranking over time. Between 1950 and 2012, eleven states experienced a double-digit increase in rank while ten states had a double-digit decline in rank. A regression model using both variable and fixed factors that affect PCPI indicates that state population growth had a negative and significant effect on state PCPI rank and higher rates of four-year college graduates had a positive and significant effect. Finally, location in the Southeast, Rocky Mountain, and Far West regions had a negative and significant effect on state PCPI ranking.

1. Introduction

During the past two decades, the literature on state per capita personal income (PCPI) has focused on the question of PCPI convergence over time. Papers by Barro and Sala-i-Martin (1992), Levernier, Partridge, and Rickman (1995), and Bernat (2001) established the convergence of PCPI among the states through 1990. Since these papers were published there appears to have been a change in the PCPI trend among states. In recent years a number of studies have indicated that the gap between higher income groups and lower income groups has been widening. In addition, looking at the past few years of state PCPI data indicates that not only has convergence among states' PCPI stopped, but it appears that it may have actually reversed.

Recently, the issue of growing income inequality among individuals has gained considerable attention in the media, in academia, and in government. In the U.S., the share of income received by the top ten percent increased from 30% in 1980 to 48% in 2012. At the same time, the share of income of the top one percent increased from 8% of total income to 19% (IMF, 2014). Juxtaposing this trend with the dynamic behavior of state PCPI discussed in this paper gives rise to myriad questions about future trends in income distribution at the state and individual levels.

This paper looks at this diverging trend in nominal state PCPI and compares what appears to be happening in recent years to the finding of convergence in previous studies. This paper also analyzes the change in trend and looks at reasons why this change is taking place. Both variable factors (state demographic trends and overall state economic performance) and fixed factors (geographic location) affecting state PCPI rankings are addressed as explanations of this trend.

The Bureau of Economic Analysis (BEA) maintains regional economic data for states as far back as 1929. Income, earnings, and earnings by industry are available on an annual basis by state from 1929 to 2011 (Tables SA1-3, SA04, SA05, and SA07).

These series provide a wealth of information that allows researchers to compare economic activity across states and to look at changes in state data over time. This paper will attempt to do a little of both and look at patterns in state income over time and across state and regional divisions. Specifically, this paper looks at nominal state per capita personal income (PCPI) over the eighty year period and identifies trends in state PCPI over time and changes in PCPI rank and position among states.

2. Literature review

The literature on state PCPI has focused on the question of PCPI convergence over time. Papers by Barro and Sala-i-Martin (1992), Levernier, Partridge, and Rickman (1995), and Bernat (2001) established the convergence of PCPI among the states through 1990. Since these papers were published, others have sought to answer more detailed questions concerning PCPI convergence and have used more refined statistical tests to analyze this issue.

Rey and Montouri (1999) use spatial econometric methods to examine U.S. regional economic income convergence from 1929-1994. The authors use real per capita income from all states in a given year and augment the typical models of convergence by controlling for spatial effects. Rey and Montouri find that there are strong geographic characteristics of convergence that further complicate the dynamics of income convergence across states and within state clusters.

Kane (2001) uses time-series techniques to determine whether conditional convergence of per capita income occurred across U.S. regions. Conditional convergence allows the steady-state income of a region to be the national average plus or minus compensating differentials which reflect unique regional characteristics such as industry mix, demographic characteristics, or location economies. Kane finds that U.S. regions are converging and that the process is completed at different points in time for each region.

Yamamoto (2003) seeks to reveal several stylized facts concerning income disparity by using a multichannel analysis, including spatial clustering analysis and non-parametric, σ-convergence, and mobility tests. His paper shows higher mobility in the 1970s and 1980s with lower, but stable, mobility levels throughout the 1990s. Furthermore, spatial clustering techniques indicate that at smaller scales the regional income distribution has increasingly become more fragmented.

Christopoulos and Tsionas (2007) contribute to the regional income literature by allowing output convergence to follow a non-linear process. They use the logarithm of regional aggregated real per capita personal income over the 1929-2001 period. The regions were New England, Mideast, Great Lakes, Plains, Southeast, Southwest, Rocky Mountain, and the Far West. Their results indicate the detection of stochastic convergence for seven out of the eight regions, with the exception being the Plains region.

Fousekis (2007) found σ-convergence occurred in the U.S. in the early 1960s. However, within this stable level of dispersion, some states completed convergence while others have not. It appears that convergence is stable, so that once a state reaches its steady-state relative to the average this condition persists.

In more recent studies, DiCecio and Gascon (2010) seek to examine convergence in time and across states, metropolitan areas, and non-metropolitan areas in the United States. They find that states which are losing positions in the income distribution are also losing population. In addition, they suggest that, although there is no convergence across states or metro/nonmetro areas, there seems to be convergence across people due to population mobility.

Diego Romero-Avila (2012) applies a panel stationarity test to examine the stochastic properties of U.S. state income levels over the 1929-2004 period. The intended outcome of this test is to uncover whether U.S.-state personal income follows a stochastic trend or is trend stationary. Overall, they find evidence of "regime-wise stationarity" in U.S. state personal income during the twentieth century.

Walden (2012) finds disparate state unemployment results from the Great Recession caused by economic structure and a drop in housing prices. Walden's findings suggest that recent PCPI divergence might be a result of significantly differing state experiences during this recent period.

Overall, most studies find convergence in PCPI for both regions and states. However, most of the studies use data that end in the 1990s or early 2000s. The pattern of increasing income inequality and regional divergence appears to be a more recent issue, and so this long body of literature is short of the most recent evidence.

3. Findings

This section presents preliminary findings based on examining more than eighty years of nominal per capita personal income data at the state level. We look at PCPI to identify evidence to support or refute the hypothesis of PCPI convergence over time. In addition to examining the question of PCPI convergence, we also look at the *pattern* of PCPI changes over time and consider the forces that have caused the pattern of changes in PCPI.

When using state-level data, there is no good solution for converting nominal values to real values over this period of time. The Bureau of Economic Analysis initiated its state cost-of-living data series in 2008. Proxies such as the state GDP deflator or housing prices provide imperfect adjustments for the cost-of-living, so we have opted to use nominal values for this paper. Cost of living differentials affect many of the drivers of state PCPI such as migration and corporate location choices (Cebula and Alexander, 2006), so developing a consistent series of real personal income data is left for future work.

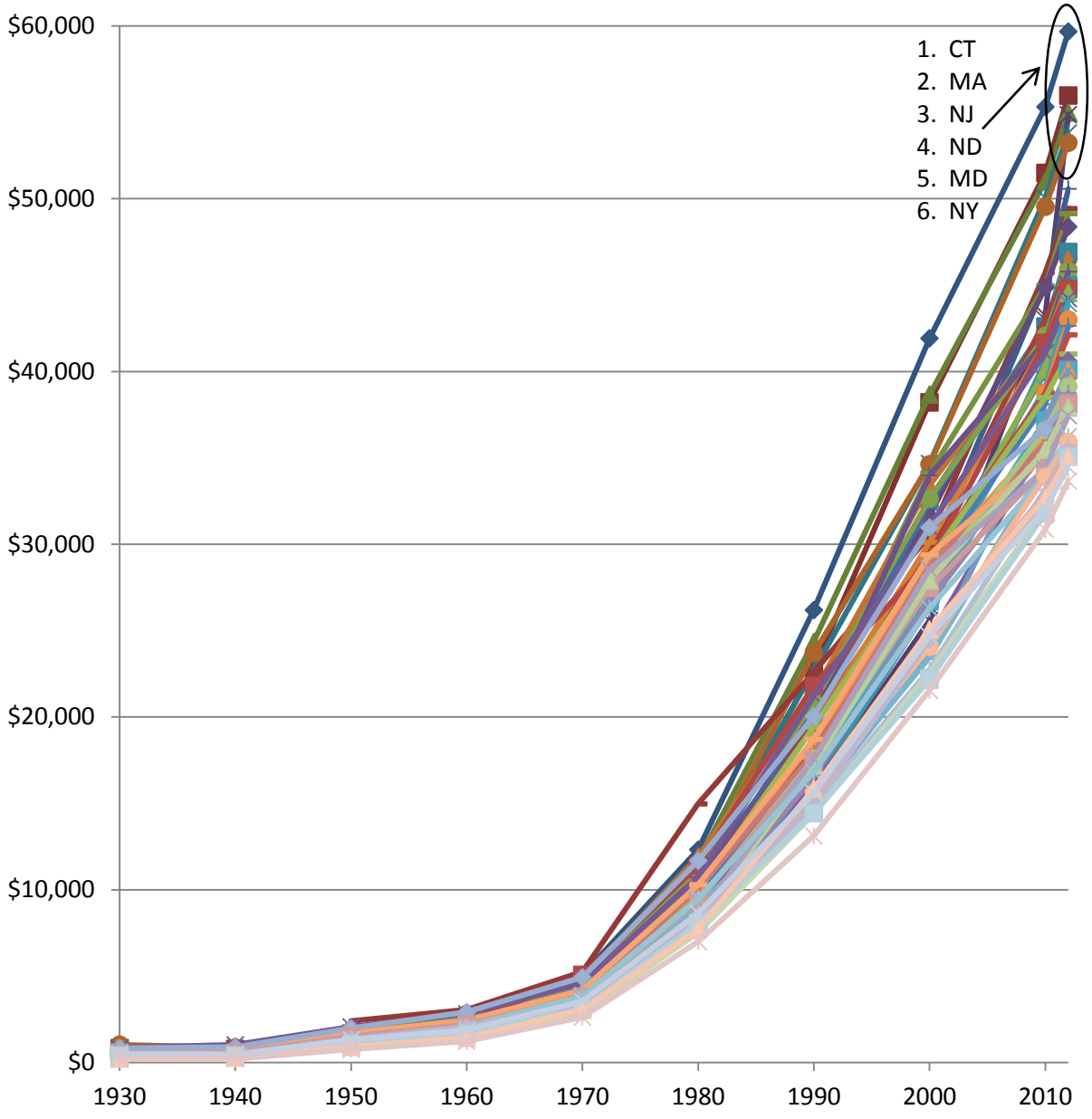

Figure 1. Per capita personal income by state.

3.1. Convergence of per capita personal income (nominal dollars)

Figure 1 details the increasing trend of PCPI by state from 1930 to 2012. In the past 20 years, Connecticut, Massachusetts, New Jersey, New York, North Dakota, and Maryland have separated themselves at the high end of PCPI; Mississippi remains the lowest PCPI state throughout the period. The overall impression from this graph is that divergence of PCPI seems more likely than convergence. This impression is due to (a) the changing scale of PCPI over the 80 year period as a result of growth and inflation; and (b) the use of nominal values of PCPI. The picture might be different if real PCPI were considered, but there is no reliable state-level price index for the period to enable that comparison.

We examined the rank order of state PCPI for evidence of convergence. Table 1 presents the rank order correlation coefficients for state PCPI ranking over the 80 years from 1930 to 2010. For each ten-year period, a Spearman rank order coefficient was calculated based on each state's PCPI in the beginning year and ten years later. Between 1930 and 1980, the ten-year rank order coefficient is consistently above 0.9. This suggests that during that fifty year period there was not much movement in states' PCPI rankings. In the decades of the 1980s and 2000s, the coefficients dropped below 0.9, suggesting that during those two periods there was more movement in state PCPI ranking than in any other decade.

Table 1. State PCPI rank-order correlation coefficients.

Years	rho	N
1930-1940	0.97655	48
1940-1950	0.90062	48
1950-1960	0.94920	50
1960-1970	0.95659	50
1970-1980	0.94247	50
1980-1990	0.88456	50
1990-2000	0.95986	50
2000-2010	0.83510	50
1950-2010	0.63131	50

Finally, a rank order correlation coefficient was calculated between 1950 and 2010. This period was chosen because it included PCPI measures for all fifty states (the 1930 and 1940 data do not contain PCPI estimates for Alaska and Hawaii). Over this sixty year period the rank order correlation coefficient was 0.6313. This indicates that while there was modest movement among state ranks during each ten year period, over the sixty year period there was much more change in state PCPI rankings.

The next perspective uses Relative PCPI for states, defined as the ratio of state PCPI for a given year to U.S. average PCPI for that year. Figure 2 presents information on the trend of the highest Relative PCPI compared to the lowest Relative PCPI for each of the 62 years between 1950 and 2012. In 1950, the state with the highest PCPI/average PCPI was approximately 75 percent greater than the U.S. average PCPI. At the same time, the state with the lowest PCPI/average PCPI was nearly 50 percent below the U.S. average PCPI. Over time the gap closed to 40 percent above the U.S. average and less than 25 percent below the U.S. average.

From the perspective of best to worst state, PCPI seems to have been converging over that 62 year period. On closer inspection we see that since 1990 there has been little change in the gap in Relative PCPI between the highest and lowest income states. One interesting side note with this data is the spike in the highest Relative PCPI during the late 1970s. This is primarily the result of the Alaskan oil boom and the resulting increase in that state's PCPI during that period.

Figure 3 presents another approach to the same issue. This chart tracks the standard deviation of PCPI relative to the average PCPI over the 62 year period. In essence, it is tracing the divergence of income across all 50 states over time. In 1950 the standard deviation of PCPI starts at around 23 percent of the U.S. average PCPI. Over time the standard deviation falls to around 15 percent of the U.S. average PCPI. The decline to 15 percent occurs by 1980 and then remains fairly constant over the next thirty years. This suggests that the convergence in state PCPI occurred up until 1980 and little change has taken place since then, broadly consistent with the rank order correlations in Table 1.

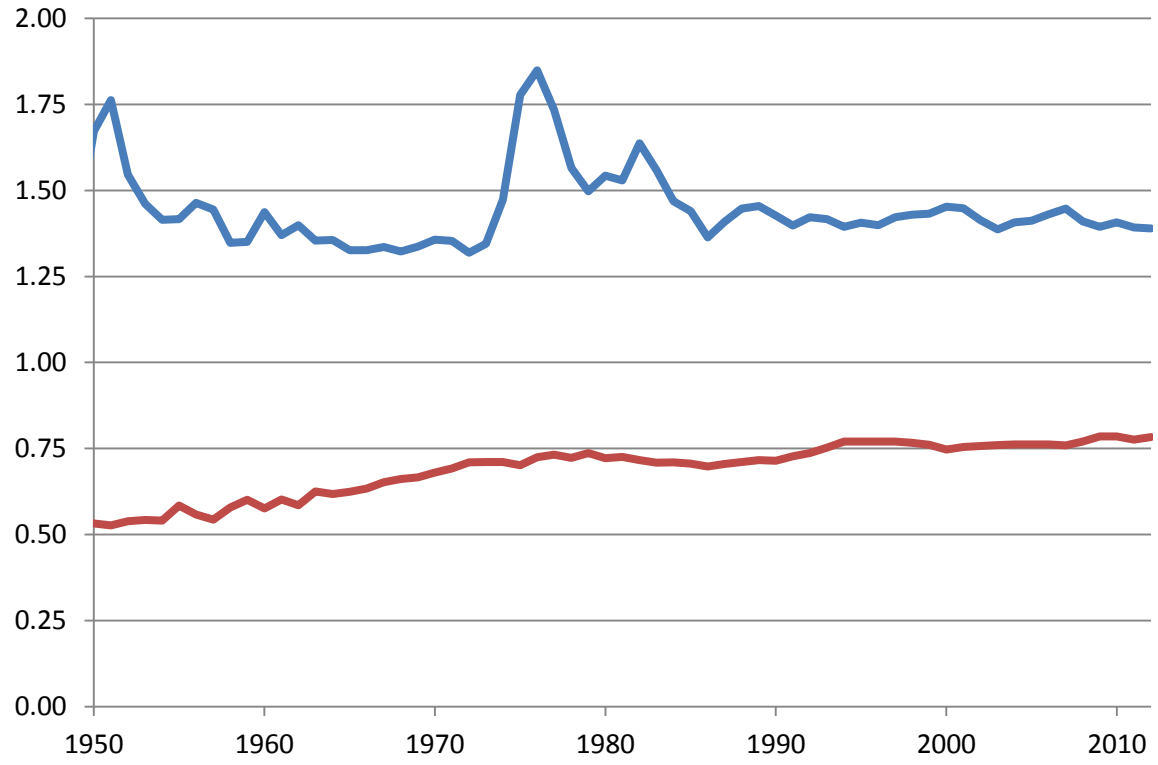

Figure 2. Relative PCPI for the highest and lowest PCPI states, 1950-2012.

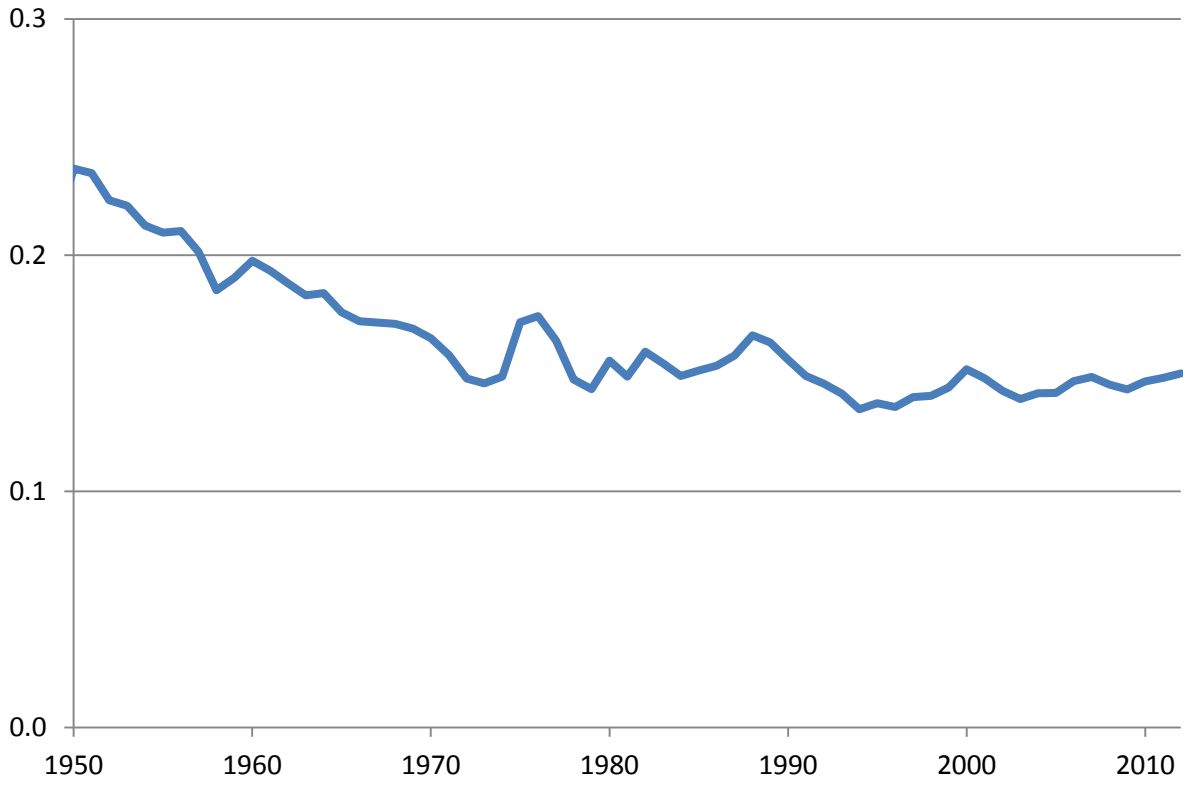

Figure 3. Standard deviation of Relative PCPI, 1950-2012.

3.2. Relative PCPI by quintiles: Prospective view

This analysis grouped states into quintiles based on their 1950 PCPI. The composition of the quintiles, shown in Table 2, is held constant throughout the analysis period. The average PCPI for each quintile is divided by the U.S. average PCPI to create the Relative PCPI for the quintile for each year from 1950 to 2012. These data are graphed in Figure 4 and summarized in Table 3.

Table 2. Quintile groups by PCPI, 1950.

Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Alaska	Wyoming	Indiana	Utah	Louisiana
Delaware	Montana	Colorado	New Hampshire	North Carolina
Nevada	Massachusetts	Wisconsin	Idaho	Georgia
Connecticut	Oregon	Kansas	Florida	West Virginia
California	Maryland	Hawaii	South Dakota	Tennessee
New York	Ohio	Minnesota	Virginia	Kentucky
Illinois	Nebraska	Missouri	New Mexico	South Carolina
New Jersey	Rhode Island	North Dakota	Maine	Alabama
Michigan	Pennsylvania	Arizona	Vermont	Arkansas
Washington	Iowa	Texas	Oklahoma	Mississippi

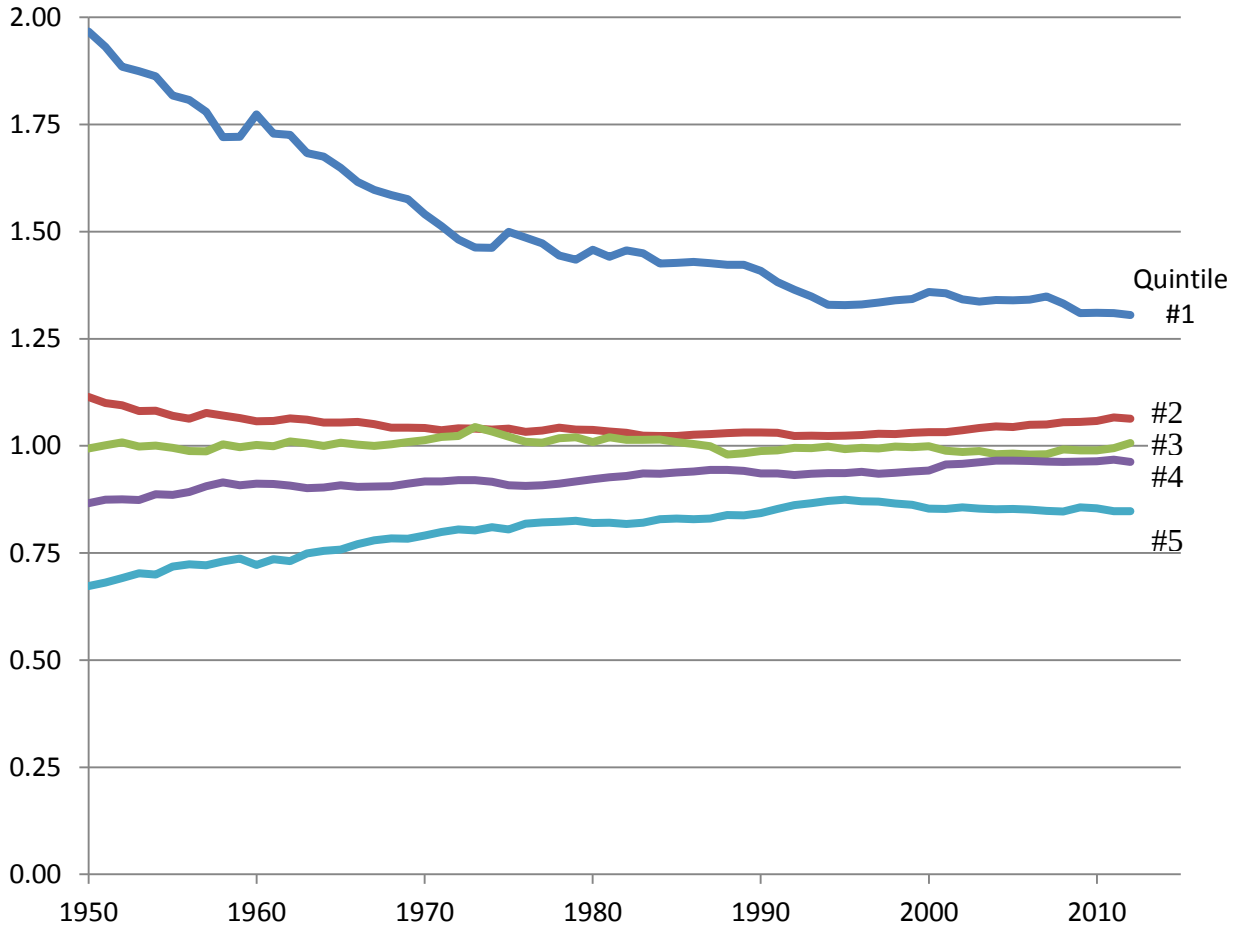

Figure 4. Relative PCPI by quintile from 1950 to 2012 using 1950 quintile groups.

Figure 4 suggests four broad trends over the analysis period:

1. Convergence is apparent. It is achieved largely through dramatic declines in the top quintile and, to a lesser extent, to growth in Relative PCPI in the fifth quintile.
2. Relative PCPI for the highest income states in 1950 (Quintile 1) declined throughout the period, with the sharpest declines in the early years.
3. Relative PCPI for the middle three quintiles converged through 1990; it has remained fairly stable since.
4. The lowest income states in 1950 have had a solid increase in their relative PCPI through the mid-1990s, with some leveling off thereafter.

An examination of the Relative PCPI data in Table 3 reveals more specific conclusions. The range of Relative PCPI (the difference between Quintile 1 and Quintile 5) decreases from 1.3 in 1950 to 0.5 in 2012. The range decreased in 42 of the 66 years in the study period. In 1950, the PCPI of Quintile 1 was nearly twice the average U.S. PCPI. By 2012, PCPI in those states was only 30.5% above the U.S. average.

The PCPI of Quintile 2 begins at just 11% above the U.S. average, substantially below the starting point of the highest income states. The Relative PCPI decreases to 3.1% above the national average in 1990 and then begins increasing thereafter. At the end of the study period, this quintile reported income 6.4% above the U.S. average PCPI. The minimum Relative PCPI value is reached in 1994 at 1.0231.

The average PCPI of the middle quintile ranges from 4.5% above the U.S. average to 2.0% below during the 62-year period. In 29 years, the Relative PCPI was greater than 1, indicating an average PCPI above the national average. Quintile 4's Relative PCPI increased from 0.8666 in 1950, to 0.9628 in 2012. The data show a positive trend, increasing in 39 years during the study period.

The lowest income states in 1950 show the greatest gains over the study period. Their relative income increased from 0.6726 to 0.8716 by 1994, then decreased slightly to 0.8473 by 2012. Relative PCPI increased for 38 years during the study period.

Table 3. Relative PCPI by quintiles for selected years 1950-2012 using 1950 quintile groups.

	1950	1960	1970	1980	1990	2000	2010	2012
Quintile 1	1.9669	1.7734	1.5408	1.4577	1.4083	1.3590	1.3108	1.3054
Quintile 2	1.1139	1.0572	1.0414	1.0369	1.0310	1.0319	1.0584	1.0633
Quintile 3	0.9942	1.0023	1.0135	1.0092	0.9880	0.9988	0.9895	1.0066
Quintile 4	0.8666	0.9119	0.9170	0.9220	0.9357	0.9426	0.9641	0.9628
Quintile 5	0.6726	0.7223	0.7907	0.8201	0.8434	0.8535	0.8546	0.8473

3.3. Relative PCPI by quintiles: Retrospective view

The forward-looking view from 1950 tells a story broadly consistent with the idea of state PCPI convergence over time. This section investigates whether quintile groupings based on 2012 PCPI will produce essentially the same results.

The quintiles based on 2012 state PCPI are in Table 4. There is broad consistency between the 1950 and 2012 rankings: forty states moved no more than one quintile in either direction. New Hampshire and Virginia moved up three quintiles; North Dakota and South Dakota moved up two. Four states − Arizona, Delaware, Montana, and Oregon − moved down two quintiles, while Nevada and Michigan fell three quintiles.

The methodology of the previous section was repeated: the average PCPI for the states in the quintile was calculated and then divided by the U.S. average PCPI. The graph of the resulting Relative PCPI by quintiles is presented in Figure 5 and summarized in Table 5.

The pattern of changes in Relative PCPI by quintile is sensitive to the quintile groupings (prospective vs. retrospective) despite the relatively small changes in the composition of the quintile groupings. The central results are:

1. The quintile groupings in 2012 do not show the same convergence of Relative PCPI seen in the groupings based on 1950 PCPI. The graphs are substantially flatter.

2. The range of observed Relative PCPI is much smaller. The difference between Quintile 1 and Quintile 5 ranges from a low of 0.29, to a high of 0.43. The comparable data for the 1950 quintiles is 0.45 to 1.29, respectively. The retrospective look is everywhere narrower than the prospective.
3. The PCPI values for the highest income group are lower. The maximum Relative PCPI for Quintile 1 is 1.23, compared to 1.97 for the 1950 quintiles. The trend for this group over the study period is slightly positive, growing from 1.17 to 1.23.
4. Quintiles 1 and 5 have higher Relative PCPI at the end of the period than at the beginning, while the Relative PCPI for the middle three quintiles is lower at the end than at the beginning of the study period.

Table 4. Quintile groups by PCPI, 2012.

Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Connecticut	Minnesota	Vermont	Louisiana	Arizona
Massachusetts	California	Delaware	Oregon	Alabama
New Jersey	Washington	Iowa	Missouri	New Mexico
North Dakota	Rhode Island	Kansas	Tennessee	Kentucky
Maryland	Illinois	Texas	Montana	Arkansas
New York	Colorado	Wisconsin	Michigan	Utah
Wyoming	South Dakota	Florida	Nevada	West Virginia
Alaska	Pennsylvania	Oklahoma	Indiana	South Carolina
New Hampshire	Nebraska	Maine	North Carolina	Idaho
Virginia	Hawaii	Ohio	Georgia	Mississippi

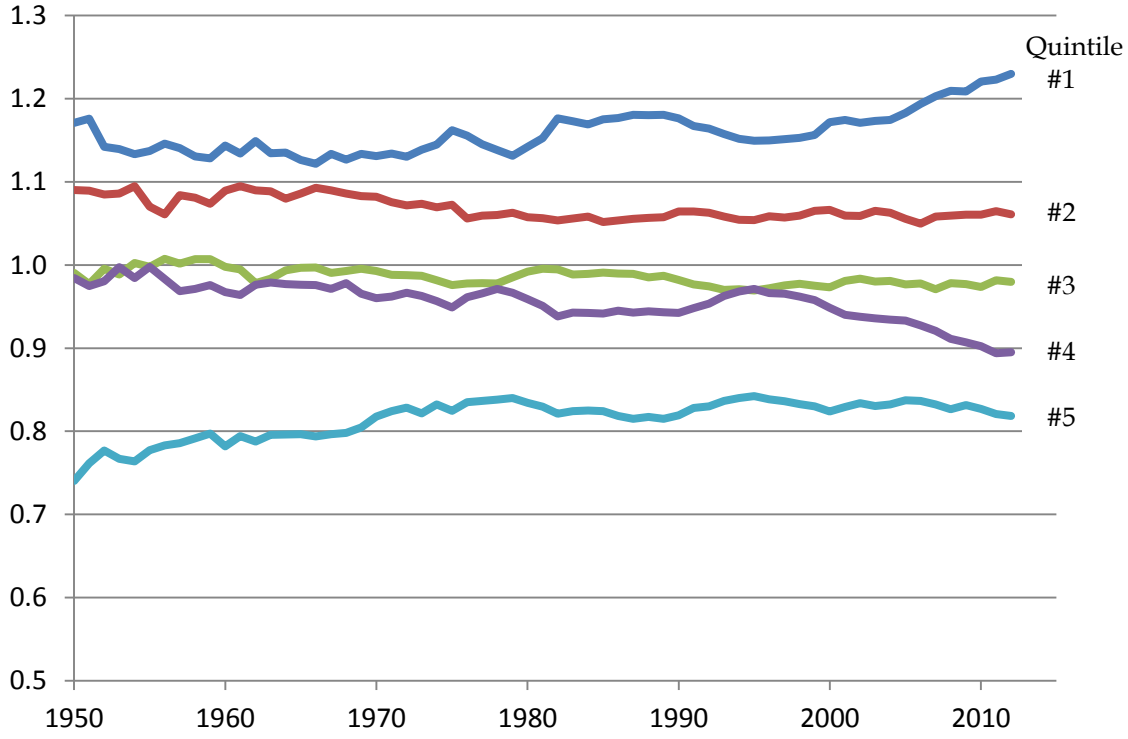

Figure 5. Relative PCPI by quintile from 1950 to 2012 using 2012 quintile groups.

Table 5. Relative PCPI by quintiles for selected years between 1950-2012, 2012 quintile groups.

	1950	1960	1970	1980	1990	2000	2010	2012
Quintile 1	1.1712	1.1438	1.1310	1.1421	1.1763	1.1719	1.2208	1.2299
Quintile 2	1.0902	1.0896	1.0820	1.0576	1.0643	1.0665	1.0607	1.0608
Quintile 3	0.9906	0.9978	0.9926	0.9922	0.9818	0.9731	0.9736	0.9797
Quintile 4	0.9842	0.9673	0.9601	0.9588	0.9422	0.9487	0.9024	0.8948
Quintile 5	0.7402	0.7817	0.8176	0.8342	0.8190	0.8239	0.8268	0.8182

4. Analysis of changes in state PCPI ranking

Table 6 presents the change in state PCPI rankings from 1950 to 2012. The changes in ranking ranged from an improvement of 26 positions (Virginia) to a decline of 34 positions (Nevada). Overall, eleven states saw a double-digit improvement in their rank order while ten states saw a double-digit decline in their rank order.

Table 6. Change in state PCPI rank for states that gained or lost at least 10 positions between 1950 and 2012.

	BEA Region	1950	2012	1950 Rank	2012 Rank	Rank Change
Virginia	5	$1,248	$48,377	36	10	26
North Dakota	4	$1,382	$54,871	28	4	24
New Hampshire	1	$1,338	$49,129	32	9	23
South Dakota	4	$1,287	$45,381	35	17	18
Vermont	1	$1,153	$44,545	39	21	18
Minnesota	4	$1,427	$46,925	26	11	15
Oklahoma	6	$1,142	$40,620	40	28	12
Massachusetts	1	$1,651	$55,976	13	2	11
Tennessee	5	$1,020	$38,752	45	34	11
Louisiana	5	$1,111	$40,057	41	30	11
Maryland	2	$1,636	$53,816	15	5	10
Arizona	6	$1,360	$36,243	29	41	-12
Ohio	3	$1,600	$40,057	16	30	-14
Utah	7	$1,343	$35,430	31	46	-15
Idaho	7	$1,321	$34,481	33	49	-16
Indiana	3	$1,515	$38,119	21	38	-17
Oregon	8	$1,646	$39,166	14	32	-18
Delaware	2	$2,066	$44,224	2	22	-20
Montana	7	$1,654	$38,555	12	35	-23
Michigan	3	$1,717	$38,291	9	36	-27
Nevada	8	$1,985	$38,221	3	37	-34

To explain the basis for such large changes in state rank order over time, a regression model was developed that includes both quantitative variables related to the structure and demographic variability between the states and fixed effects variables that control for regional differences. The following model was specified to explain the differences in the change in rank order over the 62 year period from 1950 to 2012:

$$CHANGE_i = B_0 + B_1PPOP_i + B_2PHS_i + B_3PBAC + B_4CHGURB_i + B_5DME_i + B_6DGL_i + B_7DPL_i + B_8DSE_i + B_9DSW_i + B_{10}DRM_i + B_{11}DFW_i + E_i \quad (1)$$

where:

$CHANGE_i$ is the change in the state nominal PCPI rank order from 1950 and 2012.

$PPOP_i$ is the percentage change in state population from 1950 to 2012.

PHS_i is the percent of the total population with a high school diploma in 2012.

$PBAC_i$ is the percent of the total population with a four-year college degree in 2012.

$CHGURB_i$ is the percentage change in urban population between 1950 and 2012.

DME_i is a regional dummy with a value of 1 if the state is in the Mideast Census Region and 0 otherwise. (See Appendix 1 for the location of states by BEA region.)

DGL_i is a regional dummy with a value of 1 if the state is in the Great Lakes Census Region and 0 otherwise.

DPL_i is a regional dummy with a value of 1 if the state is in the Plains Census Region and 0 otherwise.

DSE_i is a regional dummy with a value of 1 if the state is in the Southeast Census Region and 0 otherwise.

DSW_i is a regional dummy with a value of 1 if the state is in the Southwest Census Region and 0 otherwise.

DRM_i is a regional dummy with a value of 1 if the state is in the Rocky Mountain Census Region and 0 otherwise.

DFW_i is a regional dummy with a value of 1 if the state is in the Far West Census Region and 0 otherwise.

The data for all the quantitative variables were from the BEA Regional Economic Accounts. The omitted region for the qualitative variables was the New England region. Thus, the coefficients on the included regional variables are to be interpreted as the predicted difference in the percentage rank order over the 62 year period for a state in a given region versus a state located in the New England region.

The model was estimated for the fifty states using an OLS regression model and White heteroskedasticity-consistent standard errors and covariance. The regression results are reported in Table 7. This model has an R-squared value of 0.626 and an F-statistic that tests significant at the 0.01 level. Key findings are as follows:

Population change: The coefficient on the percent change in population between 1950 and 2012 is -0.013 and is significant at the 0.05 level. This indicates that for every 100 percent increase in population between 1950 and 2012, there is an expected 1.329 decline in state rank order.

Education: The coefficient for the percent of the state's population with a high school degree in 2012 has the expected sign but does not test significant at the 0.10 level. The coefficient for the percent of the state's population with a four-year degree in 2012 has the expected sign and does test significant at the 0.05 level. The coefficient indicates that for each one percent increase in the state's four-year degree percent there is a 0.987 unit change in the state's rank over the 62 year period.

Urban population: The percentage change in urban population does not test significant at the 0.10 level.

Regional effects: Three of the coefficients on the regional dummy variables (DSE, DRM, and DFW) have negative signs and test significant at the 0.10 level. States in the Southeast region, the Rocky Mountain region, and the Far West region all have negative coefficients that indicate that, on average, states within those regions suffered a double digit decline in their rank order compared to states in the control dummy, the New England region.

Table 7. Regression results for dependent variable Change in State PCPI Rank 1950-2012.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	-96.847	38.794	-2.496	0.017
PPOP	-0.013	0.005	-2.680	0.011
PHS	0.863	0.520	1.659	0.105
PBAC	0.987	0.360	2.738	0.009
CHGURB	2.325	6.485	0.359	0.722
DME	-9.066	5.094	-1.780	0.083
DGL	8.488	6.338	1.339	0.189
DPL	-17.394	5.296	-3.285	0.002
DSE	-1.589	5.275	-0.301	0.765
DSW	3.445	6.974	0.494	0.624
DRM	-15.384	7.372	-2.087	0.044
DFW	-12.093	6.374	-1.897	0.065

R-squared	0.6261	Mean dependent variable	0
Adjusted R-squared	0.5179	S.D. dependent variable	12.873
S.E. of regression	8.937973	Akaike info criterion	4.586
Sum squared residual	3035.72	Schwarz criterion	5.045
Log likelihood	-173.60	F-statistic	5.786
Durbin-Watson stat	1.848	Probability (F-statistic)	0.000021

Notes: n = 50. White Heteroskedasticity-Consistent Standard Errors and Covariance.

5. Conclusions

This paper has looked at the converging and diverging trends in state PCPI over the period beginning in 1950. The study compares the converging trend in state PCPI that has been documented in many previous studies and a recent trend of possible diverging PCPI. The study finds that the issue on convergence or divergence seems to depend on the overall assumptions about the grouping of states.

Using the prospective approach of grouping states into quintiles based on their 1950 PCPI, the pattern of changes in Relative PCPI by quintile appears to be consistent with previous studies and indicates a pattern of convergence. This pattern is strongest through about 1990 and then flattens from 1990 to 2012.

Using the retrospective approach of grouping states into quintiles based on their 2012 PCPI, the pattern of changes in Relative PCPI by quintile appears to be inconsistent with previous studies and indicates a pattern of divergence, particularly in recent years. The graph of the quintiles in early years is substantially flatter than in the prospective approach, and in recent years it demonstrates a substantial divergence in income with the top quintile increasing substantially between 2000 and 2012. It seems that not only is there a trend of the rich getting richer, but there also appears to be a trend of richer states getting richer. The question is whether it is rich individuals causing rich states to get richer or if it is rich states causing individuals to become richer.

In addition to the question of convergence versus divergence, this paper also analyzes the change in state PCPI ranking over time. The results indicate that between 1950 and 2012, eleven states saw a double-digit improvement in their rank order, while ten states saw a double-digit decline in their rank order.

A regression model using both variable factors (state demographic trends and overall state economic performance) and fixed factors (regional geography) affecting PCPI was constructed to explain the changes in state PCPI rank over time. The regression results indicate that state population growth over the 62 year period had a negative and signifi-

cant effect on state PCPI ranks. In addition, states with higher rates of four-year college graduates had a positive and significant effect on state PCPI ranking. Finally, geographic location (for states in the Southeast, Rocky Mountain, and Far West regions) had a negative and significant effect on state PCPI ranking.

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Appendix 1: BEA Regions

Region 1 New England	Region 2 Mideast	Region 3 Great Lakes	Region 4 Plains
Connecticut	New Jersey	Illinois	Minnesota
Massachusetts	Maryland	Michigan	Nebraska
N. Hampshire	New York	Wisconsin	Kansas
Rhode Island	Delaware	Ohio	Missouri
Vermont	Pennsylvania	Indiana	Iowa
Maine			S. Dakota
			N. Dakota

Region 5 Southeast	Region 6 Southwest	Region 7 Rocky Mountain	Region 8 Far West
Virginia	Texas	Colorado	California
Florida	Arizona	Wyoming	Washington
Georgia	Oklahoma	Idaho	Nevada
N. Carolina	N. Mexico	Utah	Alaska
Tennessee		Montana	Hawaii
S. Carolina			Oregon
Kentucky			
Alabama			
Louisiana			
Arkansas			
W. Virginia			
Mississippi			

Appendix 2: State PCPI rank and change, 1950-2012.

	BEA Region	1950	2012	1950 Rank	2012 Rank	Rank Change
Virginia	5	$1,248	$48,377	36	10	26
North Dakota	4	$1,382	$54,871	28	4	24
New Hampshire	1	$1,338	$49,129	32	9	23
South Dakota	4	$1,287	$45,381	35	17	18
Vermont	1	$1,153	$44,545	39	21	18
Minnesota	4	$1,427	$46,925	26	11	15
Oklahoma	6	$1,142	$40,620	40	28	12
Massachusetts	1	$1,651	$55,976	13	2	11
Tennessee	5	$1,020	$38,752	45	34	11
Maryland	2	$1,636	$53,816	15	5	10
Louisiana	5	$1,111	$40,057	41	30	10
Maine	1	$1,187	$40,087	38	29	9
Florida	5	$1,299	$41,012	34	27	7
Colorado	7	$1,512	$45,775	22	16	6
Alabama	5	$904	$35,926	48	42	6
New Jersey	2	$1,797	$54,987	8	3	5
Hawaii	8	$1,430	$44,767	25	20	5
Texas	6	$1,355	$42,638	30	25	5
Wyoming	7	$1,712	$50,567	11	7	4
Rhode Island	1	$1,549	$45,877	18	14	4
Arkansas	5	$840	$35,437	49	45	4
Connecticut	1	$1,884	$59,687	4	1	3
North Carolina	5	$1,070	$37,910	42	39	3
Georgia	5	$1,058	$37,449	43	40	3
Kentucky	5	$981	$35,643	46	44	2
Pennsylvania	2	$1,545	$45,083	19	18	1
New York	2	$1,846	$53,241	6	6	0
Kansas	4	$1,461	$43,015	24	24	0
Mississippi	5	$764	$33,657	50	50	0
South Carolina	5	$919	$35,056	47	48	-1
Nebraska	4	$1,565	$45,012	17	19	-2
Washington	8	$1,714	$46,045	10	13	-3
Iowa	4	$1,530	$43,935	20	23	-3
Wisconsin	3	$1,497	$42,121	23	26	-3
West Virginia	5	$1,048	$35,082	44	47	-3
Missouri	4	$1,421	$39,133	27	33	-6
New Mexico	6	$1,198	$35,682	37	43	-6
Alaska	8	$2,401	$49,436	1	8	-7
California	8	$1,871	$46,477	5	12	-7
Illinois	3	$1,827	$45,832	7	15	-8
Arizona	6	$1,360	$36,243	29	41	-12
Ohio	3	$1,600	$40,057	16	30	-14
Utah	7	$1,343	$35,430	31	46	-15
Idaho	7	$1,321	$34,481	33	49	-16
Indiana	3	$1,515	$38,119	21	38	-17
Oregon	8	$1,646	$39,166	14	32	-18
Delaware	2	$2,066	$44,224	2	22	-20
Montana	7	$1,654	$38,555	12	35	-23
Michigan	3	$1,717	$38,291	9	36	-27
Nevada	8	$1,985	$38,221	3	37	-34