REGIONALIZATION AND CONVERGENCE IN THE EUROPEAN UNION*

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ABSTRACT

The construction of a European political economy through regional integration is a dramatic social change that raises critical challenges for the study of markets. Does regionalization drive convergence among integrating national economies, or does regionalization deepen existing macroeconomic inequalities? The dominant theoretical approaches are at odds: orthodox economic theory and the political-institutionalist approach to markets predict convergence, whereas world systems theory and its interpretation of integration as exploitation suggest divergence. Economic theory highlights market mechanisms, whereas the political-institutional approach privileges rules and scripts of the new regional social order. Existing evidence on the convergence debate is marked by contradictory findings and a general failure to measure regional integration. This paper reports results from a time series analysis of income dispersion among the 15 countries of the European Union for the 1950-2000 period. The central finding is that regional integration is associated with convergence. The effects of political integration are especially powerful, lending support to the political-institutional approach to regionalization.

INTRODUCTION

European integration challenges economic sociology. The creation of the European Union and the construction of a regional European political economy demands sociological understanding and represents a crucial test case for theories of markets. A key question surrounding regional integration is its effect on differences among national economies: does it bring convergence by creating common regional rules via political processes, or through classical economic mechanisms such as factor mobility and trade specialization? Or, does it cause divergence by generating an internal core-periphery regional-economic structure whereby increased international investment makes poorer economies more dependent on richer ones? Sociological and economic theories differ on the consequences of European integration for economic inequality among European countries, with economic approaches, in general, positing convergence through increased regional economic exchange, and sociological approaches divided between a world systems/dependency theory argument that predicts divergence through economic integration, versus a political-institutional theory that anticipates convergence through political integration.

The question of what effect European integration has had on economic inequality among European countries also matters for practical and political reasons. The formation of the 6-country European Economic Community in 1957, its expansion and transformation into the 15-country European Union by 1995, and its expansion to 25 countries in 2004 is a dramatic and far-reaching contemporary development in international political economy that encompasses over 400 million people and is restructuring society, culture, economy, and polity in the advanced capitalist countries of

Western Europe. In support of "ever closer union," regional and national policymakers have explicitly called for the reduction of economic disparities among EU member countries, and they have adopted policies designed to accomplish this convergence. Indeed, convergence is key to the meaning of European Union, as the advance toward "one Europe" began as a way to ensure common security and common prosperity. Have the national economies of the European Union converged? If so, to what extent is this convergence related to regional political and economic integration?

These questions are also consequential for reasons that go beyond the success or failure of the European Union at accomplishing its stated goal of convergence. Much of the scholarly debate surrounding the EU concerns the impact of the EU on inequality, and because a large share of total economic inequality in the EU is likely to be between-country inequality, convergence is crucial. Some accuse the EU of expanding inequalities by contracting the welfare state (Boje et al. 1999), while others predict that inequality will grow with future integration (Kosonen 1995). Still others view the EU as a mechanism for member states to resist globalization's effect on inequality (Moses 1995). Finally, some argue that the impact of regional integration on inequality is uneven, with certain inequalities alleviated by the "regulatory supra-state" (Walby 1999). However, previous work on the key question of convergence in the European Union has produced contradictory findings, and is limited by a tendency to assume rather than measure regional integration. This paper presents a time series analysis of differences in national per capita incomes of European Union member countries over the 1950-2000 period, and finds substantial associations between convergence and regional political and economic integration.

BACKGROUND

Theories of markets drawn from economics and sociology offer several explanations for why regional integration should affect inequality in national incomes. I discuss economic theory first, and then turn to the sociological approaches of world systems theory and political-institutionalist theory.

Economic theory

Many arguments that regional integration brings economic convergence come from economic theory. For instance, economic trade theory is especially relevant to European integration because trade liberalization is a central goal of the European Union and its forerunner, the European Economic Community. Many economists argue that regional integration should bring convergence through free trade (e.g. Ben-David 1993, 1997, 2001).

Neoclassical economic theory predicts that, assuming free trade and factor mobility, less-developed economies will grow faster than more-developed ones, as a function of declining returns to capital investment (Barro and Sala-i-Martin 1992). Declining returns to capita implies that both regional economic integration and the overall level of economic development should bring convergence. Economic theory posits multiple additional mechanisms through which trade may exert convergent pressures: (1) the factor price equalization (FPE) theorem says that under completely free trade, internationally homogeneous technology, preferences and products, factor prices in a country with free trade equal world factor prices; (2) trade may allow for international

diffusion of technology, raising the technology levels of poorer countries; (3) trade in capital goods can raise GDP per capita in poorer countries by increasing capital stock (Slaughter 1997); (4) trade may reduce the perceived risk of investing in poorer countries (Slaughter 2001).[1] Trade is also one condition under which endogenous growth theory predicts convergence, in that trade "suffices to narrow the technology gap" between rich and poor trading partners (Eicher 1999:180).

Convergence research

In the literature one finds evidence for and against convergence among the world's national economies (Barro 1991; Barro and Sala-i-Martin 1992; Ben-David 1996; Firebaugh 2000; Korzeniewicz and Moran 1997; Peacock et al. 1988; Sala-i-Martin 1996a, 1996b). Some suggest that there is evidence of divergence among the world's economies, but convergence among the richest subset of economies (Fischer 2003; Pritchett 1997). This work suggests that the rich European Union countries likely converged over the 1950-2000 period studied here.

Given the EU's rapid progress toward a common market and the evidence that the creation of the EU increased the volume of trade among EU countries (Frankel 1997; Rose 2002), many economists have turned to the EU as an empirical site for testing the convergence hypothesis, but the results are inconclusive. Many find evidence of convergence (Armstrong 1995; Ben-David 1993, 2001; Dewhurst and Mutis-Gaitan 1995; Leonardi 1995), while others find mixed convergence and divergence, depending on the period and countries included, and whether convergence is measured as σ- or β-

[1] Skeptics of the convergence thesis within economics also note that trade liberalization can bring divergence under certain conditions (Slaughter 2001:206).

convergence (Marques and Soukiazis 1998; Soukiazis n.d.[a]; Soukiazis n.d.[b]), and still others find or predict divergence (Arestis and Paliginis 1995; Hallett 1981; Slaughter 1997, 2001). There is also a complex debate surrounding the conceptualization and measurement of convergence, and the interpretation of σ- and β-convergence (Sala-i-Martin 1990, 1996a). Briefly, σ-convergence is a decrease over time in the dispersion of real GDP. It is a reduction in the level of inequality in the distribution. On the other hand, β-convergence is a negative relationship between an initial level of real GDP and growth in GDP over some period of time. It is slower growth in richer economies than in poorer ones. I follow Sala-i-Martin (1996a:1328): "σ-convergence studies how the distribution of income evolves over time and β-convergence studies the mobility of income *within the same distribution*" (emphasis mine). As the hypothesis that European integration brings convergence concerns change in the distribution of per capita income rather than mobility within a constant distribution, this study examines σ-convergence.

A key methodological debate within the literature is over the use of population-weighted dispersion measures. Firebaugh (2000) notes that part of the disagreement arises from the different theoretical concerns of economists and sociologists: economists are interested in the convergence issue as a test of growth theories that predict outcomes at the level of the economy, and in such a context there is no reason to give one national economy more weight than others in the calculation of international economic inequality. Sociologists, on the other hand, study convergence for what it says about income inequality between individual people, so in a sociological context there is reason to give large countries more weight than small ones in the calculation of between-country income inequality. These methodological differences are consequential: weighted studies

tend to find convergence or stability in the level of world income inequality, while unweighted studies tend to find divergence (Firebaugh 2000).

Of the many studies in the convergence literature, Ben-David's (1993) study on σ-convergence within the European Economic Community through 1985 is one of two that comes close to mine. Ben-David goes further than the others in that he measures rather than assumes economic integration among EU countries, but even this study is limited. Regional import share is the lone measure of integration, only the six original EEC countries are analyzed, and the data extend only to 1985, just before the Single European Act took effect in 1986, and well before the Maastricht Treaty was signed in 1992. Furthermore, Ben-David does not show econometric evidence of an association between economic integration and convergence, and other work has suggested that economic integration cannot be credited with convergence among Denmark, Ireland, and the U.K., since convergence among these countries began well before they joined the EEC in 1973 (Slaughter 1997). Recently, given the EU's stated goal of reducing inequalities among sub-national regions, some convergence researchers have examined regions within the EU, finding both convergence and divergence (Dunford 1996; Marques and Soukiazis 1998). The literature is limited not only by inconclusive findings, but also, and more importantly, by a failure to econometrically model the relationship between convergence and sensitive measures of economic integration, and an exclusion of the political dimension of regional integration.[2]

[2] Ben-David's claims rest on graphs showing the timing of changes in dispersion of GDP per capita and economic integration (1993, 2001), while Slaughter's econometric analysis uses an indicator variable ("EEC liberalization") to capture economic integration. It is also important to note that economists, of course, do not rule out the state-centered theory of development or, by extension, a role for political integration in convergence (Eicher 1999:196; cf. Sala-i-Martin 1996:1341).

Bornschier, Herkenrath, and Ziltener's (2004) study of convergence and regional integration also presents an analysis that is somewhat similar to the one reported here. They examine β-convergence, using the growth rate from 1980 to 1998 as the dependent variable, and they find that regional integration – measured as the number of years each state had been a member of the EU, as well as transfers sent/received by the state through the EU's structural fund – is associated with convergence. The Bornschier et al. study differs from the analysis presented here in that (1) this analysis uses two alternative samples of the EU (the EEC-6 and the EU-15), whereas Bornschier et al. pool a sample of 33 countries, including non-EU members; (2) this analysis uses all the available data from 1950-1998, whereas Bornschier et al. use data from two years; and (3) this analysis examines weighted convergence, whereas Bornschier et al. examine only unweighted convergence.

World systems theory

World systems theory applies to the world economy the Marxian notion that capitalist exchange is inherently exploitive: the operation of the capitalist world economy increases inequality between core and periphery, and between elite and marginalized in peripheral countries (Boswell and Chase-Dunn 2000; Chase-Dunn and Grimes 1995; Wallerstein 1974). Open capital markets allow multinational corporations located in core countries to gain control over corporations in peripheral countries through investment, repatriate profits to the core, dampen reinvestment in peripheral countries, forestall creation of spin-offs in the periphery, and capture peripheral states (Dixon and Boswell 1996). This exploitation of the periphery by the core through foreign investment stunts economic

growth in the periphery (Bornschier and Chase-Dunn 1985; Kentor 1998; Kentor and Boswell 2003; cf. Firebaugh 1992). The result, as repatriated profits spur growth in the core, is divergence.

World-systems analysts have focused on underdevelopment in the periphery and global economic inequality, but this approach can be extended to the regional economy. Extending world systems theory in this direction, regional integration and the intensification of intra-regional international investment that it brings (Fligstein and Merand 2002:19) may produce divergence through the effects of investment dependence on development, as the regional core exploits the regional periphery and the regional periphery becomes dependent on investment from the regional core. This divergence should not occur among the six original members of the European Union. It should be more likely to occur among the 15 states that were members of the EU by 1995, given that the EU expanded to include Greece in 1981, and Spain and Portugal in 1986, and divergence is most likely among the 25 states that are now members of the EU. Böröcz and Sarkar (2005) argue that the new EU member states from Central and Eastern Europe, and pre-accession states like Bulgaria, Romania, and Turkey, are dependent on the EU in the classical sense: The Eastern enlargement of the EU required the opening of national markets to EU firms, without a corresponding extension of political rights to Central and Eastern Europeans. This allowed for the extraction of surplus from the enlargement economies and the further accumulation of capital in the European Union (Böröcz and Sarkar 2005: 157-159).

Thus, this extension of world systems theory suggests that regional integration may bring economic divergence through the mechanism of investment dependence.

Sociologists have not tested these implications of this extension of world systems theory in the context of regional integration, as world systems theory applies to dynamics in the world-economy. However, world systems scholars have examined the consequences of regional trading blocs like the EU for the structure of the world-economy (Blanton 1999) and the potential impact of European integration on tendencies for global political integration and U.S. hegemonic decline (Boswell and Chase-Dunn 2000), and world systems research has documented divergence in the world-economy as a whole (Babones 2002; Korzeniewicz and Moran 1997; cf. Firebaugh 2000).

Political-institutionalist theory

A political-institutionalist approach to convergence and regional integration can be synthesized from the political-cultural approach to markets (Fligstein 2001), neo-institutionalist "world polity theory" (Meyer et al. 1997), and the state-centered theory of economic development (Evans 1995). World polity theory holds that states enact policy scripts diffused and legitimated by international organizations (Boli and Thomas 1999; DiMaggio and Powell 1983; Meyer 2000; Meyer and Rowan 1977; Meyer et al. 1997), and the theory can be extended in the context of regional political integration to predict that the production of regional policy scripts affects economic development: states should converge in their development policies as they adopt regional scripts. The state-centered theory of development connects the generation and adoption of regional policy scripts to economic development. Under this scenario, regional political integration brings convergence by isomorphically structuring the state organizations and policies that have been shown to affect economic development (Evans 1995; Evans and Rauch 1999).

Related arguments for convergence come from institutionalist economic sociology: the political creation of region-level understandings should generate increasingly similar economic outcomes (Fligstein 2001). In the language of Fligstein's political-cultural approach (Fligstein 1996, 2001), regional political integration establishes a regional social order (European Union, the regional polity) that permits the establishment of regional markets that contain regional fields. Regional political integration should bring economic convergence as economic actors follow common rules, markets increase in size and complexity, and economic growth stabilizes throughout the region. As this brand of institutionalist economic sociology is relatively new, the implications of the theory for convergence in the European Union have not been tested, although the reinforcing relationship between political and regional integration in the European Union has been examined (Fligstein and Stone Sweet 2002), and the intensification of market exchange among European countries has been noted (Fligstein and Merand 2002).

DATA AND METHOD

Any analysis of European integration is complicated by the changing composition of the European Union. The forerunner to the EU, the European Economic Community, was established in 1957 by treaty among Belgium, France, Germany, Italy, Luxembourg, and the Netherlands, but since then the EU has added nine members: Austria, Denmark, Finland, Greece, Ireland, Portugal, Spain, Sweden, and the United Kingdom. Because the variables used in the analysis would be affected by the changing membership of the EU, this analysis uses two samples: (1) the 15 countries that are currently members of the

European Union, and (2) the 6 countries that were members of the original European Economic Community. Because international trade data are reported for the Belgium-Luxembourg Economic Union rather than separately for Belgium and Luxembourg until the late 1990s, I calculated all variables for the Belgium-Luxembourg Economic Union; thus, the EU-15 sample includes 14 "countries" and the EEC-6 sample includes 5 "countries."

The dependent variable in this analysis is dispersion in real GDP per capita. Data come from the Penn World Table, which provides purchasing-power-parity (PPP) estimates in 1996 dollars for the period 1950-2000 (Heston et al. 2002).

I use three common measures of dispersion: the coefficient of variation (standard deviation divided by the mean), Gini coefficient, and standard deviation of logarithms. The coefficient of variation and the standard deviation of logarithms are the two most common measures of σ-convergence. These unweighted measures were calculated in Stata using the *inequalr* add-on command (Kolenikov n.d.; Whitehouse 1995). I also use two weighted measures of dispersion, the coefficient of variation and standard deviation of logarithms, following Firebaugh (Firebaugh 1999:1608).

Consistent with conceptualization of regional integration as having both political and economic dimensions (Fligstein and Stone Sweet 2002), the independent variables are political and economic integration.[3] Following Fligstein and Stone Sweet (2002), political integration is measured as the number of cases sent from national courts to the European Court of Justice. This measure improves on measures of political or formal integration used in previous work (typically, an indicator variable for "member of the

[3] The correlation between political integration and economic integration for the EU-15 is .73. For the EEC-6, the correlation is .42. These imperfect correlations suggest that the political and economic integration measures tap distinct aspects of regional integration.

EU" where the unit of analysis is country, or "establishment of the EU" where the unit of analysis is region or world). Under Article-177 of the 1957 Rome Treaty, national courts forward cases involving EU law to the European Court of Justice, the judicial body with final, binding authority to interpret EU law. Thus, the number of cases forwarded from member states of the EU in a given year is an indicator of claims made on laws of the regional polity by members of national polities. I argue that an increase in the cases sent to the regional court indicates increasing integration of national polities with the regional polity, and deepening institutionalization of the regional polity. A complete time series of observations on this variable is available through 1997; data come from Stone Sweet and Brunell (1999).

I also use an alternative measure of political integration: the number of directives adopted by the European Union in a given year. In the EU, the European Commission is the body that has responsibility for advancing the adoption of common policies, and monitoring progress toward integration. The Commission also has the authority of legislative initiative, and proposes directives to the Council of Ministers. The Council of Ministers then decides, sometimes in cooperation with the European Parliament, whether to adopt directives. If a directive is adopted, the goals of the directive are binding on the member states, although the member states are free to determine the precise legal mechanism of compliance. Member states comply with EU directives through the adoption of national implementing measures. If a member state fails to comply, the European Commission can bring suit against it in the European Court of Justice under the provisions of Article 169 of the Rome Treaty. Thus, the number of directives adopted in a given year is one measure of the construction of the European polity. The data form a

time-series, where region-year is the unit of analysis, and the data come from the European Union's CELEX database (European Communities 2004; Office of Official Publications of the European Communities 2002). The correlation between these two measures of political integration is .90.

Economic integration is measured as exports to EU countries as a percentage of total exports.[4] Intraregional exports have been used in previous work as a measure of economic integration (Fligstein and Stone Sweet 2002; Frankel 1997). This measure taps the extent to which the national economies of the EU are embedded in exchanges with other EU countries, and as such this indicator of economic integration has face validity.[5] Economic integration increases if countries within the region trade with each other more, and economic integration decreases if countries within the region trade with each other less, as a proportion of their total trade. Complete time series of observations on exports by country are available for all EU countries except Austria (which is missing data for the 1957-1959 period) through 1999; the data for Germany are for West Germany through 1990. Data were provided by Andrew Rose and come from the IMF's *Direction of Trade CD-ROM*. Calculation of the economic integration measures was straightforward: the exports measure was calculated by dividing the sum of exports to EU countries from other EU countries in a given year by the sum of exports from EU countries in that year.

[4] Frankel (1997:21-25) notes that intraregional trade shares will be larger for regions with more countries, which makes intraregional trade shares inadequate measures of regional integration in the context of interregional comparisons. The impact of region size on intraregional trade share also makes time-series analysis problematic, if the size of the region varies over time. Neither issue is relevant to this analysis, since I do not compare regions, and I analyze change in economic integration within the EEC-6 and the EU-15 separately.

[5] Another valid indicator is intraregional investment share; i.e., direct investment within the region as a proportion of the region's total direct investment. Unfortunately, data on this measure are only available from 1980 onward, which prevents this measure from being a useful addition to the time-series analysis. Supplemental analysis suggests that intraregional investment share follows the same trend as intraregional trade share through the 1980-2000 period among the EU-15: intraregional investment share increases at first then decreases, following an inverted U-shape (see Figure 2).

I also use an alternative measure of regional economic integration, the regional import share. Imports from the EU as a percentage of total imports is calculated by dividing the sum of imports from EU members by the sum of total imports by EU members in a given year. Data are from the same source as above. Results for the imports measure are substantively identical to those reported in the tables.

I also control for the EU's total GDP per capita, to assess the hypothesized effect of economic development. To construct the measure of GDP per capita at the EU level, I divide the sum of GDP for all the EU countries by the sum of the populations of all the EU countries. EU GDP per capita is coded in thousands of 1996 US dollars. Data are from the Penn World Table (Heston et al. 2002).

I use time-series models to estimate the relationship between dispersion in GDP per capita at year *t* and political and economic integration at year *t*-1. OLS regression can be used with trending time-series variables when the variables are *cointegrated*. Cointegrated time-series meet two conditions: (1) they are integrated of the same order – for instance, if a series is stationary after taking first-differences, it is integrated of order 1, denoted I(1); (2) the residuals from a levels-on-levels regression of two or more cointegrated time-series are stationary – that is, they are I(0). Given that the time-series variables used in this analysis satisfy the conditions for cointegration, I follow Hamilton (1994) (also see Greene [2000], Gujarati [1995], and Wooldridge [2003]) and estimate OLS regressions using the untransformed time-series in their original levels. By Dickey-Fuller tests for unit roots, the analysis variables are integrated of order 1, thereby satisfying the first condition for cointegration. By Engle-Granger tests, the second condition for cointegration, that the residuals from the cointegrating regression be

stationary, or I(0), is also satisfied in many of the models. As a robustness check, I also estimate OLS models with an autocorrelation-consistent covariance matrix estimator, the Newey-West estimator. This model is designed to account for serial autocorrelation in the residuals. As there are some OLS models where the second cointegration condition is not satisfied, the fact that the Newey-West results are consistent with the OLS results is reassuring. I discuss the Newey-West results in the text, but for the sake of space, these models are not shown.

The analysis proceeds as follows. First, I perform Dickey-Fuller unit root tests for stationarity to assess whether the variables are I(1). Next, I estimate regressions of each dependent variable on the one-year lags of the political integration measure and the economic integration measure. Following estimation of the models, I then check the residuals for stationarity, using the Engle-Granger test, with critical values from MacKinnon (1991). For each model, I report the coefficient estimates, standard errors, R-squared, and Engle-Granger test statistics. Where the Engle-Granger test statistic is marked with an asterisk, the test is evidence for cointegration (that is, a significant test statistic means that the null hypothesis of nonstationarity in the residuals can be rejected).

RESULTS

My strategy for the analysis is to begin by discussing the trends in economic convergence, political integration, economic integration, and economic development among the two populations of interest: the six original members of the European Union, and the 15 states that were members of the EU by 1995. Next, I turn to the time series analysis, starting with unweighted dispersion among the EEC-6.

Graphical evidence

Before turning to the tables, it is useful to examine graphs of (unweighted) dispersion in real GDP per capita and regional integration over time. Figure 1 shows a sharp increase in political integration since the 1960s and economic convergence through the 1970s, but there is clear evidence of *divergence* among the EEC-6 since 1991.[6] As the data on political integration extend only to 1997, it is difficult to say whether this divergence is driven by a decrease or stabilization of political integration. If the political-institutionalist approach is correct, we would expect that the pace of political integration among the EEC-6 should have slowed in the late 1990s. Figure 2, which plots dispersion in GDP per capita and economic integration, suggests that this divergence in the 1990s among the EEC-6 might be related to a decrease in economic integration: among the EEC-6, economic integration first increases dramatically through the early 1970s, then decreases slightly through the early 1990s, then drops off sharply.

Figure 3 shows the coefficient of variation in GDP per capita and the number of Article-177 cases, for the EU-15 countries. The number of cases trends strongly upward beginning in about 1966, indicating increasing political integration. Conversely, the coefficient of variation in GDP per capita trends strongly downward through most of the period, with stabilization or perhaps a slight increase between 1973 and 1990[7], and an

[6] Replacing the 1970-1990 West Germany data with observations for unified Germany changes the convergence trend (to stable but slower convergence from 1970 to 1990), suggesting that the bumpy stabilization/increase over this period in Figure 3 is driven by the observations for West Germany. However, the post-1991 divergence remains.

[7] It seems plausible that this stabilization/increase could be explained by the observations for West Germany through 1990. Estimates of PPP-converted GDP are available for unified Germany from 1970 onward from the Penn World Table, which makes it possible to assess this conjecture. Supplemental analysis using these data shows that convergence among the EU-15 levels off from the mid-1970s through

apparently declining rate of decrease in the 1990s. The data suggest a relationship between the sharp increase in political integration and the notable economic convergence in the European Union, although the existence of any association is best established by econometric analysis. Regardless of the possible relationship between economic convergence and political integration, the finding of convergence in the European Union is important in its own right, and it bolsters earlier studies that found convergence (e.g., it shows that convergence through 1985 demonstrated by Ben-David [1993] continued through the expansion and deepening institutionalization of the European Union in the 1990s).

Figure 4 plots dispersion in GDP per capita and economic integration over time. Here again there is some evidence that regional integration brings convergence: as economic integration increased dramatically through the early 1970s, EU economies converged at a rapid rate, but as the pace of economic integration slowed after the mid-1970s, so too did the rate of convergence. This is consistent with predictions drawn from economic theory that increasing trade brings convergence, and inconsistent with the implication of world systems theory that regional economic integration polarizes national economies, although these competing claims are best adjudicated by the econometric analysis below. Comparing Figure 3 to Figure 4, it appears that among the EU-15, both economic and political integration were associated with economic convergence since 1950, but that the relationship between economic integration and convergence may be stronger than that between political integration and convergence.

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the mid-1980s, and this suggests that including the observations from West Germany through 1990 does not explain the stabilization/increase shown in Figure 1.

This graphical evidence is consistent with the political-institutionalist approach and the predictions of economic theory, but econometric analysis is necessary to rigorously assess these hypotheses. I now turn to the time series analysis.

Time series analysis

The impressions suggested by the graphs are confirmed, in part, by the time-series regression models of the unweighted dispersion measures. Table 1 shows results from cointegrating regressions of the coefficient of variation in GDP per capita on two measures of political integration, one measure of economic integration, and the measure of the level of economic development in the EU, for the six original members of the EU. Model 1 shows that political integration (the number of Article-177 cases forwarded to the ECJ for preliminary references) has a statistically significant negative association with the coefficient of variation in per-capita income. This is consistent with the hypothesis drawn from the political-institutionalist approach that political integration brings economic convergence. Model 2 shows that this result holds for the second measure of political integration, the number of directives adopted by the EU. Both associations are strong: the standardized coefficient for the Article-177 cases measure is -.824, and the standardized coefficient for the directives measure is -.846.

Turning to the economic covariates, Model 3 shows that the measure of economic integration, exports from EU economies to EU economies as a percentage of total exports from the EU, is also negatively associated with the coefficient of variation in GDP per capita. This supports the hypothesis drawn from economic theory that regional economic integration brings convergence of national economies. However, the size of the

association between economic integration and convergence is smaller than that between political integration and convergence: the standardized coefficient for economic integration is -.654. More importantly, the economic integration series is not cointegrated with the dispersion series: the Engle-Granger test does not fall below the 5% critical value of -3.469 (or the 10% critical value of -3.135). This suggests that the residuals from this regression are serially autocorrelated, and the results cannot be interpreted as evidence that economic integration and economic convergence have a long-run relationship.

Model 4 shows that economic development is also associated with convergence: the coefficient for EU GDP per capita is negative and statistically significant at the 5% level. This is consistent with the approach to convergence drawn from orthodox economic theory (Barro 1991). While the association is strong (the standardized coefficient is -.865, the Engle-Granger test statistic (-3.244) just falls below the 10% critical value (-3.135). This is marginal evidence that the series are cointegrated, and suggests that economic development and convergence among the EEC-6 may not share a long-run relationship. Indeed, in models that include GDP as a control, the Engle-Granger test is never significant, even at the 10% level, suggesting that non-cointegration of the GDP series may "swamp" the cointegration of the other series.[8]

OLS models with standard errors estimated by the Newey-West autocorrelation-consistent covariance matrix estimator (ACCME) give substantively identical results to those shown. Both measures of political integration, the measure of economic

[8] I also estimated models of two alternative measures of dispersion: the Gini coefficient and the standard deviation of logarithms. Results from these models are substantively identical to those shown, except that the EU GDP per capita series fails the cointegration test (even at the 10% level) for both alternative dependent variables. This is further evidence that GDP and dispersion in GDP are not cointegrated.

integration, and GDP show statistically significant negative associations with dispersion in GDP per capita among the EEC-6.

Do these findings hold for the EU-15? Table 2 shows that to some degree, they do. In terms of the bivariate associations, the results are identical: both measures of political integration, the measure of economic integration, and the measure of economic development are significantly and negatively associated with dispersion in GDP per capita among the EU-15. The magnitudes of the associations are actually larger than those shown in Table 1, and the increase in the size of the economic integration coefficient is especially large: it increases from -.654 to -.901. However, the evidence for cointegration of these series is much weaker for the EU-15 than for the EEC-6. The only series that is cointegrated with convergence is the directives series. In this cointegrating regression (Model 2), the Engle-Granger test statistic (-3.159) just barely surpasses the 10% critical value (-3.135).[9]

Results from OLS models with Newey-West standard errors are substantively identical to those shown in Table 2: the number of Article-177 cases, the number of EU directives, EU exports, and EU real GDP per capita are significantly and negatively associated with dispersion in real GDP per capita among the EU-15.

Population-weighted results

Conclusions of convergence studies often depend on whether the measure of income dispersion is unweighted or weighted by population. Is the dramatic income convergence

[9] Results from models of the alternate measures of dispersion (the Gini coefficient and the standard deviation of logs) suggest that the marginal evidence of cointegration between the directives and dispersion series is not robust: in both of these alternative models, the Engle-Granger test is not significant at the 10% level. Results for the other covariates are substantively identical to those shown.

in the European Union shown above in the unweighted dispersion measures also seen in weighted measures of dispersion? Figure 5 shows the trend in weighted convergence – measured by the coefficient of variation and the standard deviation of logarithms – for the 6 original EEC countries. The weighted convergence in this figure is similar to the unweighted convergence shown in Figure 1. The figures are strikingly similar, but there is one notable difference: there appears to be very slight unweighted divergence during the 1960s, but stronger weighted divergence during the same period. This probably means that a large country (France, Germany, or Italy) within the EEC-6 diverged from the others during the 1960s. It is interesting that the post-1990 divergence shown in Figure 1 is also apparent in Figure 5: it seems that whether one is interested in weighted or unweighted between-country income dispersion, there is divergence among the original members of the EU.

Figure 6 shows graphical evidence for the EU-15: the figure shows the trend in weighted convergence between 1950 and 2000, again for two measures of weighted convergence, the coefficient of variation and the standard deviation of logarithms. Figure 6 shows essentially the same converging trend as Figure 3, suggesting weighted and unweighted convergence. The only notable difference is that Figure 6 shows clear weighted divergence 1973-1990, whereas Figure 3 showed only slight divergence or perhaps stabilization in the same period. This discrepancy between the figures suggests that the GDP figures for West Germany are indeed driving the divergence in that period, as West Germany is one of the largest countries in the sample and its GDP "artificially" declined in 1991 with reunification with East Germany.

Table 3 shows results from time-series models of weighted dispersion in real GDP per capita among the EEC-6. The results for weighted dispersion are substantively identical to those for unweighted dispersion shown in Table 1. Model 1 indicates that the number of Article-177 cases has a strong and statistically significant negative association with dispersion (the standardized coefficient is -.816), and the Engle-Granger test suggests that the series are cointegrated. Model 2 shows the same finding for the second measure of political integration: the negative association between the number of EU directives and weighted dispersion in per-capita GDP is large (the standardized coefficient is -.827) and statistically significant, and the series are cointegrated.

Once again, the results are somewhat weaker for economic integration (Model 3). Although the negative association between EU exports and weighted dispersion in GDP per capita is statistically significant, it is smaller (standardized coefficient = -.607) than in the political integration models, and the Engle-Granger test shows that the series are not cointegrated.

Model 4 is a regression of weighted dispersion on EU GDP per capita. Again the results mirror those shown in Table 1: while there is a significant negative association between dispersion in GDP per capita and the level of GDP per capita, there is only weak evidence that the series are cointegrated. The Engle-Granger test statistic of -3.381 just falls below the 10% critical value of -3.135. As above, regressions that include GDP per capita as a control are not cointegrated.[10]

OLS estimates combined with Newey-West standard errors produce results that are substantively identical to those shown in Table 3: in all four models, the negative

[10] Results from models that use the alternative measure of weighted dispersion, the standard deviation of logarithms, give substantively identical results to those shown, except that the EU GDP series fails the Engle-Granger test for cointegration (the test statistic is -3.1, just above the critical value).

association between the respective covariate and weighted dispersion in real GDP per capita among the EEC-6 reaches statistical significance at the 5% level.

Table 4 shows results from models of weighted dispersion among the EU-15 member states. The Engle-Granger tests suggest that no independent variable is cointegrated with weighted dispersion, as all test statistics (-2.567, -2.896, -2.571, and -2.532, respectively) fail to reach even the 10% critical value of -3.135. This indicates that the residuals from the cointegrating regressions are serially correlated. In OLS models with Newey-West standard errors that correct for this autocorrelation, the coefficients retain their statistical significance at the 5% level.[11]

DISCUSSION

The construction of an integrated European regional political economy – the European Union – is one of the most dramatic developments in postwar world politics, and the implications of this regional integration for national economies are far-reaching. Sociological and economic theories concerning consequences of regional integration for differences in national incomes within an integrating region are contradictory: economic theory and the political-institutionalist approach to markets predict convergence with integration, whereas world systems theory and its interpretation of integration as exploitation suggest divergence. Existing evidence on the convergence debate supports both sides, with some studies finding evidence of convergence, while others find divergence. Most previous studies are limited by their failure to measure regional integration. This paper offers a time series analysis of differences in income among the 15 countries of the European Union for the 1950-2000 period and finds evidence that

[11] Results from models of the standard deviation of logarithms are substantively identical.

regional integration is associated with population-weighted and unweighted income convergence. This strong, statistically significant association holds for three measures of dispersion, political and economic dimensions of regional integration, and the EU-15 countries as well as the EEC-6 countries.

Cointegrating time-series regressions show evidence of long-run relationships between regional political integration and convergence for the EEC-6, but not the EU-15. That is, there is evidence that political integration brings convergence among the original six members of the European Union. The association between political integration and convergence is also larger than that between economic integration and convergence among the original six. This pattern of findings lends support to the political-institutionalist approach, given that the original six members of the EU have been more intensely exposed to the forces of regional integration since the 1950s.

The results offer less support to the approach to regional integration developed from classical economic theory. Classical economic theory finds some support from the results that show that economic integration – measured as the percentage of total exports from EU countries that is directed toward EU countries – is associated with convergence, but for the EEC-6, the effect of economic integration is weaker than the effect of political integration. Furthermore, the economic integration series is not cointegrated with the GDP-dispersion series. This suggests that the political process of creating regional rules is an especially strong force for convergence. It is also noteworthy that the level of GDP per capita for the EU is not cointegrated with dispersion in real GDP per capita, which contradicts the argument that economic development brings convergence.

The strong association between political integration and convergence bolsters the argument that the construction of political institutions is essential to the operation of markets (Fligstein 2001). There is evidence that enactment, diffusion, and enforcement of regional rules and the consolidation of the European polity create the social order that enables action in the regional economy. The growing similarity of national economies may reflect the aggregation of a myriad of market actions enabled by uniform regional rules. Although this study cannot assess the impact of regional political integration on the micro-actions of workers, investors, and firms, the finding that political integration is closely associated with convergence is suggestive.

Setting aside the crucial issue of regional integration, the simple fact that European Union economies have converged since 1950 is itself an important finding, and one that advances the literature on world income inequality. If one accepts the conclusion that between-country income inequality has stabilized in recent decades (Firebaugh 1999, 2000; cf. Korzeniewicz and Moran 1997; Pritchett 1997), then the significant convergence within the European Union (and especially the EEC-6) implies that convergence in Europe must have been offset by divergence elsewhere. EU convergence with divergence elsewhere supports the view that rich countries are converging while the rest are diverging, and it suggests a way forward for world systems theory: while it may not be true that the increasing integration of the world-economy polarizes incomes among all national economies, it may be that world-economic integration brings convergence to the core but divergence to the periphery (Peacock et al. 1988).

Convergence in the EU presents two additional intriguing puzzles. First, while the significant decrease in income disparities between the 15 EU countries is obvious, it is also obvious that the rate of decrease has slowed since the mid-1970s. There is even evidence of divergence among the original six members of the EU – Belgium, France, Germany, Italy, Luxembourg, and the Netherlands – since around 1990. Does this mean that Europe is experiencing a U-turn on between-country income inequality to match the U-turn on within-country income inequality (Alderson and Nielsen 2002)? If so, why? Figures 3.2 and 3.4 suggest that this stabilization/divergence might be associated with the recent stabilization/decrease in economic integration. But it is doubtful that declining economic integration tells the whole story given that the decline in economic integration among the EEC-6 started well before 1990. Either way, given the implications of a U-turn on between-country inequality combined with the U-turn on within-country inequality, the causes of this recent development call for further analysis. The second puzzle also links between- and within-country income inequality: given dynamics in the between- and within-country income distributions in the European Union, how has total income inequality changed? Given that between-country inequality was the larger component of total *world* income inequality in the latter half of the 20th century (Firebaugh 2000), it is possible that income convergence across the EU has offset the U-turn on inequality within EU countries.

Considering the recent expansion of the European Union to 10 new member states in 2004, it is interesting to speculate on the impact of that expansion for income disparities within the new EU. Obviously, there will be more income dispersion among the 25 than among the 15, but more interesting to consider is whether those disparities

will grow or shrink with time. The results suggest that if entry into the EU is followed by increasing economic and political integration, the new member countries should catch up to the old ones, bringing convergence. But there is an important caveat. Following world systems reasoning on the internal peripheralization of poorer countries under regional integration, it is possible that the new member states could be starting from a position of such disadvantage relative to the rest of the EU that they could remain a slowly-growing EU periphery, cut off from a rapidly-growing EU core. It is likely that such divergence would exert disintegrative pressures on the EU, unless of course increased political integration became a powerful countervailing force. The scenario of rising international income inequality within the EU is consistent with the interpretation of Central and Eastern European societies as dependent on the EU (Böröcz and Sarkar 2005).

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Figure 1. Coefficient of Variation in PPP-Converted GDP per Capita and Number of Article-177 Cases, 6 European Economic Community Countries, 1950-2000

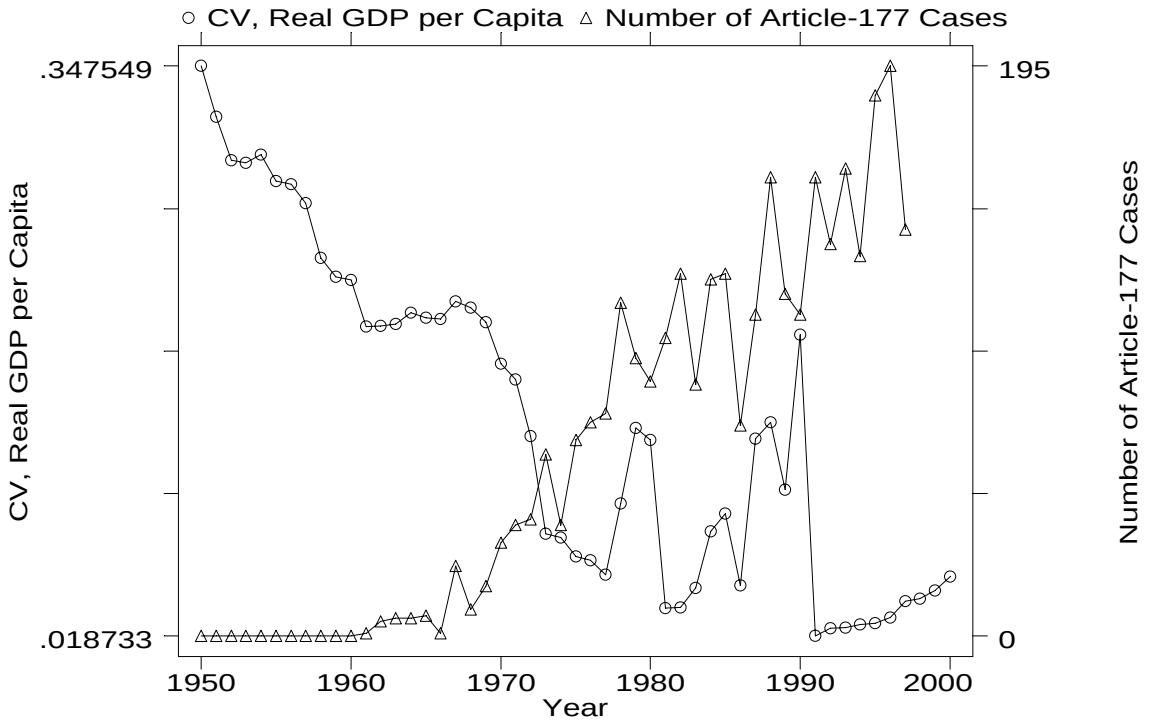

Figure 2. Coefficient of Variation in PPP-Converted GDP Per Capita and Exports to the European Union as a Percentage of Total Exports, 6 European Economic Community Countries, 1950-2000

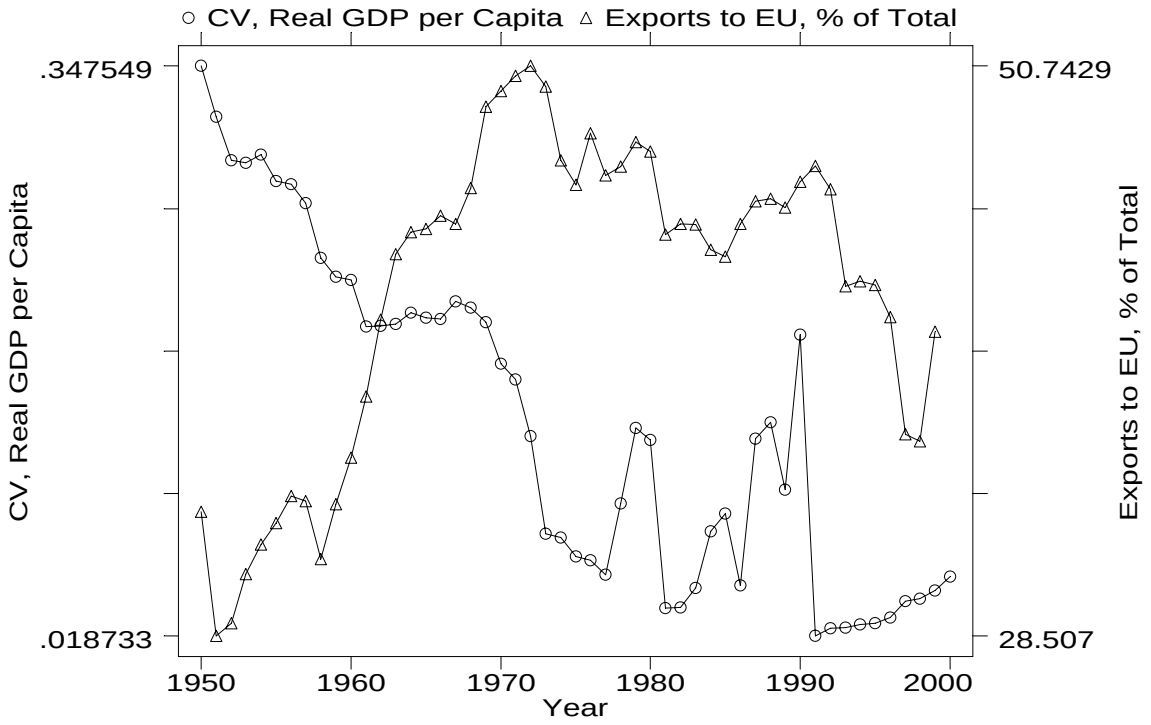

Figure 3. Coefficient of Variation in PPP-Converted GDP per Capita and Number of Article-177 Cases, 15 European Union Countries, 1950-2000

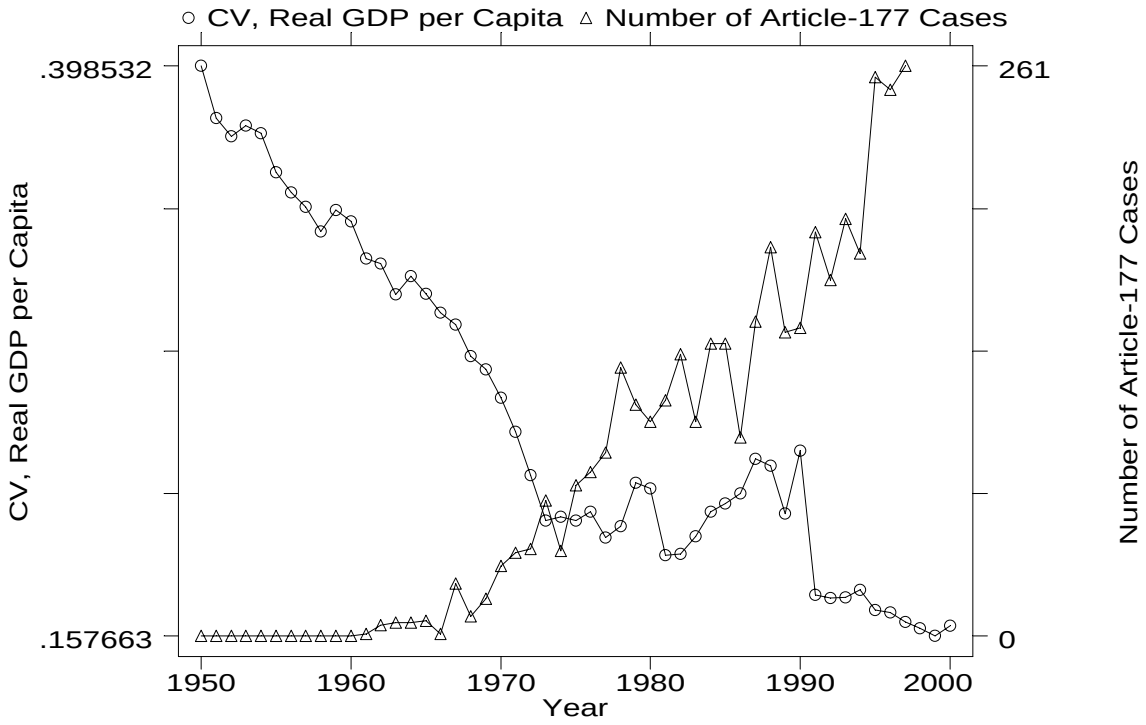

Figure 4. Coefficient of Variation in PPP-Converted GDP Per Capita and Exports to the European Union as a Percentage of Total Exports, 15 European Union Countries, 1950-2000

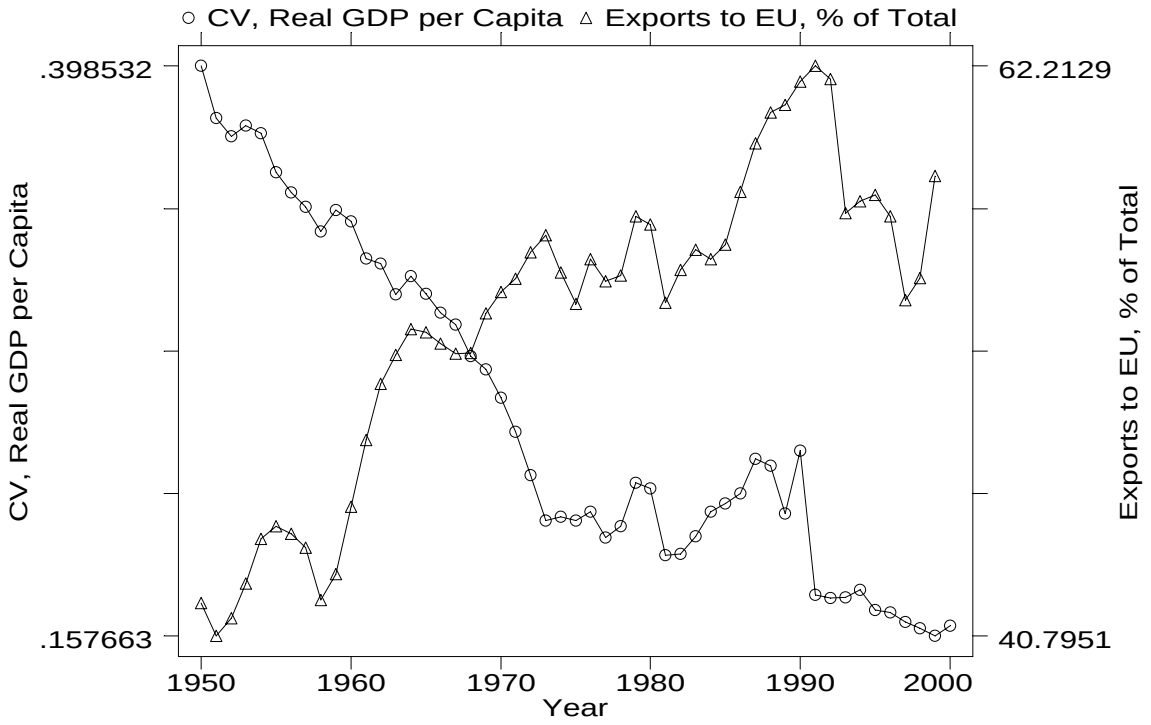

Figure 5. Weighted Convergence in Real GDP Per Capita (PPP Conversion) among 6 European Economic Community Countries, 1950-2000

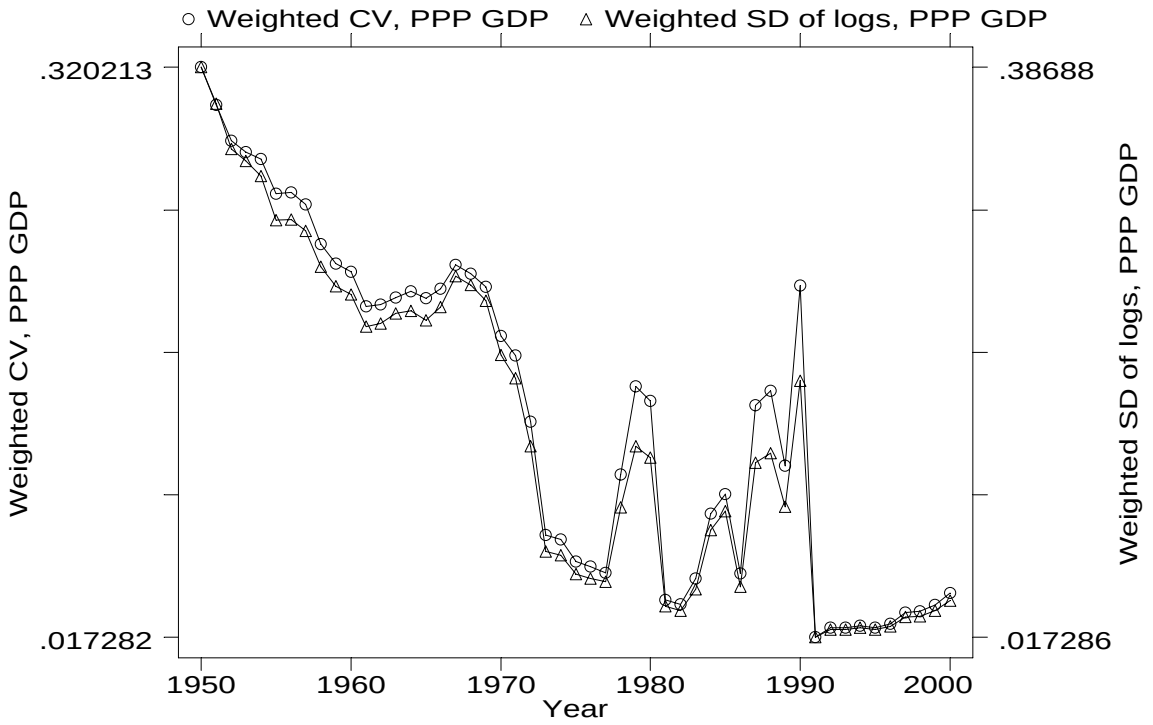

Figure 6. Weighted Convergence in Real GDP Per Capita (PPP Conversion) among 15 European Economic Community Countries, 1950-2000

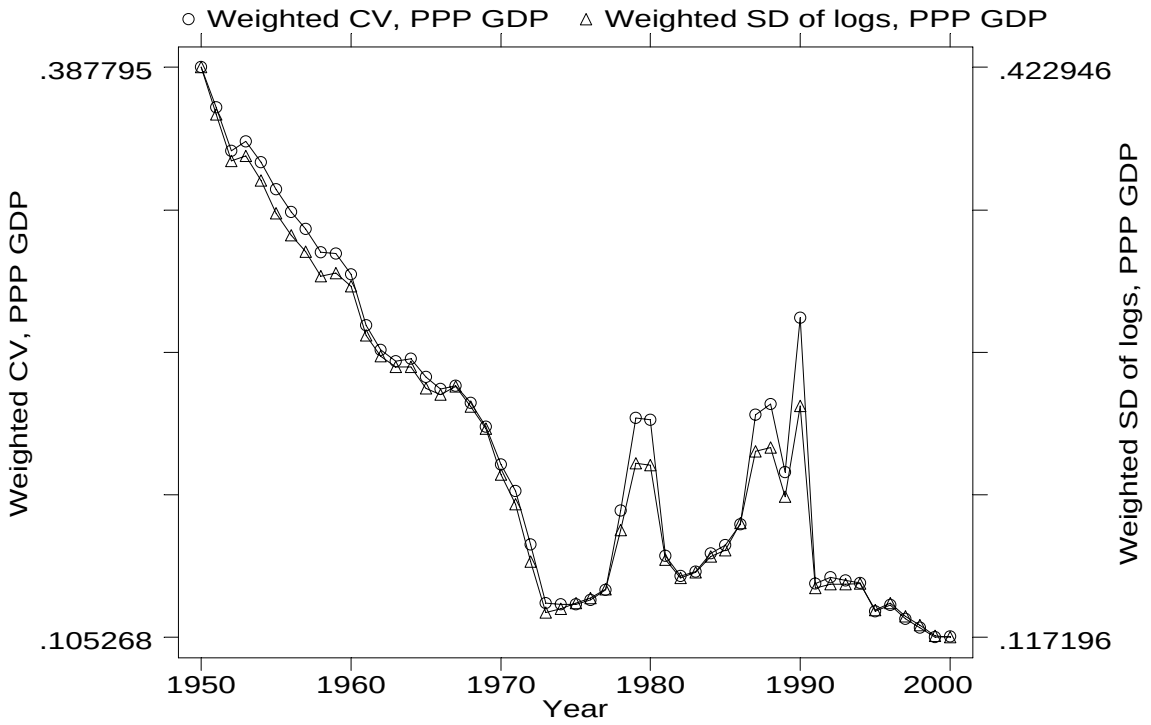

Table 1. Unstandardized Coefficients from OLS Regressions of the Coefficient of Variation in Real GDP per Capita on Measures of Regional Integration and Real GDP per Capita, 6 European Economic Community Countries, 1950-1998

Variable	Model 1	Model 2	Model 3	Model 4
Article-177 Cases	-.125**			
	(.013)			
Directives		-.200**		
		(.019)		
Exports to the EU, % of Total Exports			-.973**	
			(.166)	
EU Real GDP per Capita				-1.375**
				(.117)
Constant	22.129**	23.472**	55.296**	31.702**
	(1.102)	(1.118)	(7.066)	(1.635)
R^2	.679	.715	.428	.749
Cointegration tests:				
Engle-Granger	-3.661**	-4.001**	-1.720	-3.244*

Notes: Independent variables are lagged one year.
Standard errors in parentheses.
*$p < .10$; **$p < .05$ (two-tailed tests, except cointegration test)

Table 2. Unstandardized Coefficients from OLS Regressions of the Coefficient of Variation in Real GDP per Capita on Measures of Regional Integration and Real GDP per Capita, 15 European Economic Community Countries, 1950-1998

Variable	Model 1	Model 2	Model 3	Model 4
Article-177 Cases	-.071**			
	(.007)			
Directives		-.152**		
		(.012)		
Exports to the EU, % of Total Exports			-.962**	
			(.068)	
EU Real GDP per Capita				-1.242**
				(.072)
Constant	30.577**	32.228**	81.732**	40.425**
	(.757)	(.712)	(4.033)	(.953)
R^2	.693	.783	.812	.866
Cointegration tests:				
Engle-Granger	-2.287	-3.159*	-1.487	-2.103

Notes: Independent variables are lagged one year.
Standard errors in parentheses.
*$p < .10$; **$p < .05$ (two-tailed tests, except cointegration test)

Table 3. Unstandardized Coefficients from OLS Regressions of the Population-weighted Coefficient of Variation in Real GDP per Capita on Measures of Regional Integration and Real GDP per Capita, 6 European Economic Community Countries, 1950-1998

Variable	Model 1	Model 2	Model 3	Model 4
Article-177 Cases	-.118**			
	(.012)			
Directives		-.186**		
		(.019)		
Exports to the EU, % of Total Exports			-.861**	
			(.166)	
EU Real GDP per Capita				-1.281**
				(.119)
Constant	21.333**	22.492**	50.220**	30.152**
	(1.074)	(1.124)	(7.080)	(1.663)
R^2	.666	.683	.369	.714
Cointegration tests:				
Engle-Granger	-3.804**	-4.020**	-1.811	-3.381*

Notes: Independent variables are lagged one year.
Standard errors in parentheses.
*$p < .10$; **$p < .05$ (two-tailed tests, except cointegration test)

Table 4. Unstandardized Coefficients from OLS Regressions of the Population-weighted Coefficient of Variation in Real GDP per Capita on Measures of Regional Integration and Real GDP per Capita, 15 European Economic Community Countries, 1950-1998

Variable	Model 1	Model 2	Model 3	Model 4
Article-177 Cases	-.066**			
	(.010)			
Directives		-.144**		
		(.020)		
Exports to the EU, % of Total Exports			-.999**	
			(.102)	
EU Real GDP per Capita				-1.202**
				(.137)
Constant	25.521**	27.154**	79.200**	35.232**
	(1.133)	(1.173)	(6.001)	(1.806)
R^2	.467	.542	.678	.627
Cointegration tests:				
Engle-Granger	-2.567	-2.896	-2.571	-2.532

Notes: Independent variables are lagged one year.
Standard errors in parentheses.
*$p < .10$; **$p < .05$ (two-tailed tests, except cointegration test)