

## **ECONOMIC GROWTH AND SOCIAL CAPITAL IN ITALY**

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### **INTRODUCTION**

The northern parts of Italy have been richer than the southern for several centuries, despite having been on a par at the beginning of the millennium. Recent research has shown that these differences in per capita income are matched by differences in the societal structure, with horizontal structures common in the North and hierarchical forms in the South, and by differences in the extent of civic community, citizen involvement and governmental efficiency [Putnam, 1993]. Other studies have shown evidence of convergence among the Italian regions, as among the sub-national regions of other European countries, in terms of the growth of real per capita incomes from 1950 to the early 1980s [Barro and Sala-i-Martin, 1991]. But recent data show a new divergence of regional per capita incomes, dating from 1983. In this paper we attempt to link and explain all three pieces of evidence.<sup>1</sup>

Our hypothesis is that some Italian regions have been able to establish and maintain higher levels of output per capita by virtue of greater endowments of social capital. However, greater openness and education levels in the past thirty years have increased the ease with which the poorer regions can emulate productivity advances elsewhere and have thus facilitated convergence in both the levels and rates of growth of regional per capita incomes. The divergence during the 1980s is especially surprising inasmuch as it came in the face of massive interregional transfer payments and other interventions by the central government aimed at reducing the North-South disparities. We hypothesize that this divergence can be traced, in part, to the possibility that the increased powers of regional governments, as they came into play at the beginning of the decade, were used more effectively in those regions with more social capital. Within the framework we are testing, this divergence should be self-limiting and eventually reversing, since the increasing gap between rich and poor regions enlarges the scope for future transfer of knowledge.

We start with a brief description of our various regional measures of civic community in Italy. Then we consider a theoretical framework in which differences in social capital affect the nature and extent of economic convergence and present our estimates of the ways in which civic community and convergence appear to be jointly determining regional growth patterns in Italy. Finally, we consider the evidence of the economic effects of regional government reforms.

Italy was governed from Rome until steps were made in the 1970s to elect regional governments and subsequently to give them significant powers. In mid-1975 regionalist forces in parliament managed to secure passage of a law authorizing the decentralization of important new functions to the regions. By mid-1977 agreements were reached "...that dismantled and transferred to the regions 20,000 offices from the national bureaucracy, including substantial portions of several ministries, such as the Ministry of Agriculture, as well as hundreds of semipublic social agencies" [Putnam, 1993, 22]. Regional governments took time to exploit the new powers and to adapt to the new responsibilities. The funds expended by regional governments rose from next to nothing in 1970 to almost 10 percent of GDP by the end of the 1980s, with most of the growth taking place in the 1980s [Putnam, 1993, 25]. The watershed, if one must be found, may have been in 1981-82, after the first full round of post-devolution regional elections. By that time, interviews show that the regional councillors had become more pragmatic, less ideological, and more regionally focused in their contacts.<sup>2</sup> We shall attempt later in the paper to assess whether these institutional reforms had consequences for economic growth.

## **SOCIAL CAPITAL IN ITALIAN REGIONS**

Whether judged by how long it takes to get a phone answered at a government office, or by polls of citizen satisfaction with regional governments, there are major continuing differences among the Italian regions in how well government works. Although the nature of the available evidence has changed from one decade to the next, almost all of it supports the notion that these differences have existed for centuries. We conjecture that the differences date from the time when hired guns came into the South with authoritarian structures in hand, while the northern communities became linked instead by tower societies and other means of cooperative action involving more horizontal and open structures of government and society [Putnam, 1993, esp. Ch. 5]. These initial differences have been reinforced and countered in succeeding centuries, however, by many other factors, such as trading patterns and foreign occupation. The historical origins and trajectory of this North-South split remain a matter of considerable controversy [Cohen, 1994; Ridolfi, 1994].

Our concern in this paper, however, is not with how these differences may have become established, but with how they can be measured, and what influence they are still likely to have in the late twentieth century. We shall generally restrict our review to features that have been measured as part of the earlier research and which have been found to have explanatory power in determining the effectiveness of local government. The three variables of principal interest, all of which are explained in more detail in Putnam [1993], are:

1. Civic Community (*Civic*). This index of social capital is a composite measure of four indicators, two intended to measure the breadth and depth of civic community (newspaper readership and the availability of sports and cultural associations) and two related to the political behavior of citizens (turnout in referenda and the incidence of preference voting).<sup>3</sup> The four measures provide strikingly consistent results. Italians living in the nine regions from the Abruzzi south generally read fewer newspapers, have fewer sports and cultural associations, vote less frequently in referenda, and are more likely to use preferential voting. The converse is the case for the northern regions. With only minor exceptions, the four indicators all rank the northern regions as more civic than the southern. However, within each of the two main regional groupings, civic community differs substantially, and the four indicators provide different rankings.
2. Institutional Performance (*Perf*). This is a composite measure of the comparative performance of regional governments. It covers twelve separate elements, ranging from the timeliness of budgets to legislative innovation (across domains ranging from preventive medical clinics to consumer protection) to direct measures of bureaucratic responsiveness (e.g. the speed and accuracy of responses to citizen requests for information about established programs). Measures on each of the twelve dimensions are combined into a single factor score for institutional performance. The dates for the assessments are over the period 1978-1985.
3. Citizen satisfaction (*Satis*). This is based on a number of large sample surveys between 1977 and 1988, in which respondents were asked how satisfied they were with the activities of their regional government. The index of satisfaction used here is the share of respondents who were 'very' or 'rather' satisfied, with the alternatives being 'little' or 'not at all' satisfied.

There are fairly tight linkages among the three variables, with the higher levels of civic community associated with higher measures of institutional performances and greater citizen satisfaction. The causal logic in Putnam [1993] runs from civic community, for which stable roots are traced back for centuries or more, to institutional performance, with this leading to greater citizen satisfaction with regional government.

## ECONOMIC GROWTH AND SOCIAL CAPITAL

Those who have been struck by the persistence in Italy of systematic regional differences in everything from civic community to per capita incomes may be inclined to doubt whether convergence could be present to the extent suggested by the results of Barro and Sala-i-Martin [1991] and others, which refer more generally to income differentials among sub-national regions in Europe and the United States. The convergence literature makes a distinction between unconditional convergence, in which the degree of income dispersion lessens among countries, and conditional convergence, which reflects a tendency for income gaps to be narrowed when all other rel-

evant variables are equal.<sup>4</sup> If it were possible to find evidence of either conditional or unconditional convergence, does that necessarily imply no causal economic role for the systematic differences in civic institutions and efficiency that Putnam and his colleagues have identified? We think that it is possible to lay out a theory of partial conditional convergence that leaves room for institutional differences to influence rates of growth and levels of income. Such a theory could still permit a role for conditional convergence in establishing a form of trickle-down technical progress which serves to limit the size of the income gaps in the long run between regions with differing qualities of institutions. Indeed, the idea that progress and institutional reform might be incremental and experimental, with successes copied by other regions, is reflected in some of the components of the measure of institutional performance presented above. For example, the indicators relating to reform legislation, legislative innovation, day care centers and family clinics all relate to the speed and extent to which the regions adopted laws and programs usually developed and tested elsewhere. It should be noted that although expenditures are used to define the extent of some of these activities, the amounts do not simply measure the ability to pay of the regions, since program spending on these activities is financed by the national government.

We will now be more explicit about the form of our view of partial conditional convergence. In this study, we use real GDP per capita as our measure of income per capita, since our primary emphasis is on productivity, and since in any event we do not have data accounting for regional differences in the amount and ownership of physical capital. GDP per capita can be defined as the quintuple product of some measure of cyclical capacity utilization (a ratio of actual output to what it would be at normal rates of utilization), normal output per employee, the employment rate (employment as a fraction of the active labor force), the labor force participation rate (measured as a fraction of the population of labor force age) and the fraction of the population of labor force age. Normal output per employee is in turn a function of the stocks of physical, human, and social capital and the efficiency with which they are used. In this study, by using GDP per capita as the variable of interest, and using measures of social capital to explain regional differences in its level and rate of growth, we are implicitly assuming that measurable differences among regions in other factors are not large, or at least are not correlated with the measures of social capital being used. Since these assumptions are unlikely to be fully met, the best way to interpret our research is as an attempt to show the total direct and indirect effects of differences in social capital, recognizing that they may appear in a variety of forms. These may include higher investment rates, higher rates of education, more efficient government services, better social institutions (e.g. operation of the civil and criminal justice systems), and more efficient operations within individual firms.

This leaves open the possibility, if we find that some measures of social capital are correlated with higher levels or rates of growth, that we have not properly identified a reduced-form system, in that causation may be running from higher levels of GDP per capita to better institutions. Our best bet for ensuring that a correlation, if found, runs from institutions to economic performance lies in the regional government reforms instituted at the end of the 1970s. These reforms may have given better

institutions more scope to encourage growth. If those regions with more social capital were to experience a subsequent period of higher growth, we would have solid evidence that some significant part of any correlation linking social capital and economic growth must be attributed to causation running from social capital to economic performance. We shall follow up that line of enquiry in the next section. In the current section we set up a system that treats social capital as a determinant of the level and or the rate of growth of income per capita. Since we do not have comparable time series for regional measures of the components of physical or human capital, we use real per capita regional GDP as a composite efficiency measure, bearing in mind that it encompasses differences in natural resources, location, private capital, education levels, and public infrastructure as well as the measures of social capital that are the primary focus of our attention in this paper.<sup>5</sup>

If we use  $A_{it}$  to represent real per capita GDP in region  $i$  in year  $t$ , a theory of partial conditional convergence can be specified by the following equation for the rate of growth of income:

$$(1) \quad \ln(A_{it}/A_{i,t-1}) = \delta(\ln(\gamma_i A^*/A_{i,t-1})) + \delta_{it}.$$

The first term represents a model of conditional partial convergence. If income per capita in region  $i$  is less than fraction  $\gamma_i$  of per capita income ( $A^*$ ) in some leading region with which region  $i$  is in economic contact, then the fraction  $\delta$  of the gap will be closed each year. If the region-specific growth rate ( $\delta_{it}$ ) of productivity is the same as in the leading region, then eventually the level of income per capita in region  $i$  will approach the fraction  $\gamma_i$  of the level in the leading region. This is a model of partial convergence, since it accepts the possibility that the level of income in region  $i$  will always be less than that in the leading region (if  $\gamma_i < 1.0$ ), whether because of differences in natural resources, civic traditions, or whatever else may have enduring and not fully transferable impacts on economic well-being. It is a model of conditional convergence because changes in country-specific or aggregate factors, entering through changes in the  $\gamma_{it}$  or  $\delta_{it}$  can alter the timing, extent, and even the existence of unconditional convergence. Inter-regional differences in the quality of government may enter this framework through differences in either the  $\gamma_{it}$  or  $\delta_{it}$ .

Conditional partial convergence ensures that, however great the regional differences in the quality of government, the equilibrium growth paths for the regions in general have different levels but equal growth rates, so long as the inter-regional differences in institutions remain constant. Whether a difference in the quality of government enters primarily as a level effect ( $\gamma_{it}$ ) or a rate of growth effect ( $\delta_{it}$ ) affects only the dynamics of the adjustment path, which in any event will be difficult to establish clearly, given the variety of other unspecified factors influencing regional development. If regional differences of the quality of government do not change measurably, then any attempt to separate  $\gamma_i$  and  $\delta_{it}$  channels will be fruitless. Since the bulk of our available measures of the structure and effectiveness of civic society in Italy are either estimates for a single year, or averages over several observation points, our estimation form for equation (1) reduces to the following cross-sectional equation attempting to explain regional differences in growth rates of per capita incomes between time  $t-n$  and time  $t$ :

$$(2) \quad \ln(A_{it}/A_{i,t-n}) = a_0 + a_1 \text{Civic} + a_2 \ln A_{i,t-n} + \epsilon_i$$

where  $a_0 = 6(\ln(A^*))$ ,  
 $a_1 = 6(\ln(\gamma_i)) + \delta_i$ ,  
 $a_2 = -6$ , and  
 $\epsilon_i$  is an error term assumed to be normally distributed and uncorrelated with any measure (*Civic* is the example employed in equation (1)) used to capture the relative strength of civil society in each region.

Table 1 reports results from estimating equation (2) using the measures of civic community, institutional performance and citizen satisfaction as alternative indicators of the quality of growth-supporting institutions in the Italian regions. The regressions using the measures of civic community and institutional performance cover twenty regions, while equations using citizen satisfaction cover only the eighteen largest regions. The growth period covered is 1950 through 1990. The results in equations (i) through (iii) use ordinary least squares regression, while those in equations (iv) through (vi) are estimated by instrumental variables regression, using 1970 values for income per capita as instruments for 1950 income to avoid the risks of coefficient bias emphasized by Friedman [1992] and Quah [1993].<sup>6</sup> As expected, the results using instrumental variables show slightly smaller and less significant convergence effects. Nevertheless, the convergence effects are significant in all equations and the social capital effects are significant at the 1 percent level in five of the six equations. The equations combining conditional convergence with social capital effects are significantly more accurate than those based either exclusively on social capital or unconditional convergence. Estimates of the same equations on a decade-by-decade basis reveal that the good fit of the model is based almost entirely on the experience of the 1960s and 1970s, with its explanatory power being essentially zero for the 1950s and the 1980s.

The failure of convergence in the 1950s and the 1980s can be seen quite clearly by inspecting the top part of Figure 1, which shows the standard deviations of regional per capita incomes from 1950 to 1990, with gaps for the years for which we do not have suitable measures. The data show a slight increase in the dispersion from 1950 to 1960, a steady and highly significant decline from 1960 to 1983, and a sharp increase thereafter. In the absence of more observations before 1960, we shall concentrate our attention on the experience of the 1980s, especially since it may be linked to changes in the structure of regional government.

### **DID THE REGIONAL GOVERNMENT REFORMS MAKE A DIFFERENCE?**

In this section we assess the extent to which the reforms of regional government might have contributed to the reversal of convergence during the 1980s. The top part of Figure 1 shows the time series of standard deviations of the natural logs of per capita incomes in the twenty regions, covering the 1950 to 1990 period, using the most appropriate measure for each year for which data are available.<sup>7</sup>

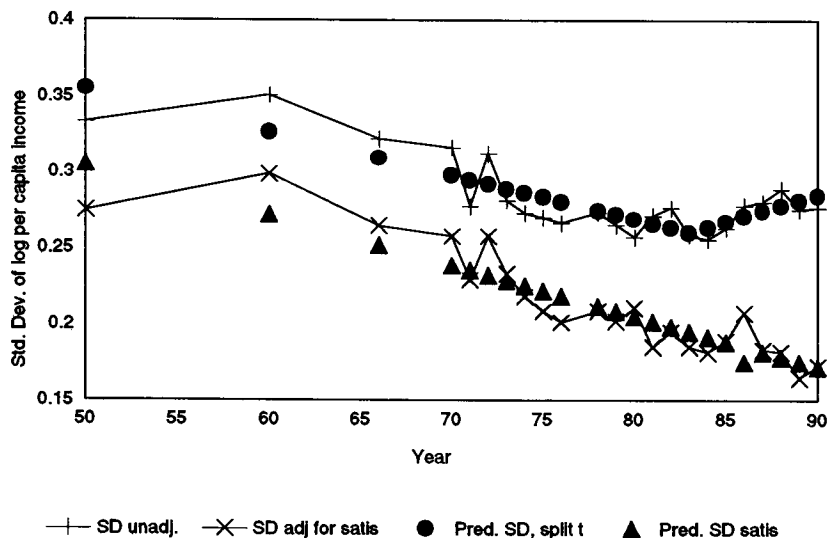
**TABLE 1**  
**Effects of Social Capital on Regional Growth with**  
**Conditional Convergence**

Equation	(i)	(ii)	(iii)	(iv)	(v)	(vi)
No. of Observations	20	20	18	20	20	18
Estimation Method	OLS	OLS	OLS	IV	IV	IV
Dependent Variable	gr5090	gr5090	gr5090	gr5090	gr5090	gr5090
Constant	1.395 (2.46)	-.174 (0.86)	-.079 (0.13)	.489 (0.67)	-.065 (0.12)	-.872 (1.22)
<b>Coefficients</b>						
lnGDP50	-.717 (7.14)	-.544 (6.32)	-.456 (4.17)	-.557 (4.36)	-.458 (4.77)	-.315 (2.49)
Civic	.172 (4.80)			.124 (2.84)		
Perf		.118 (3.84)			.096 (2.93)	
Satis			.096 (2.63)			.063 (1.58)
R <sup>2</sup>	.739	.671	.477	.699	.651	.419
S.E.E.	.0848	.0953	.1085	.0910	.0980	.1144

Absolute values of *t*-statistics are in parentheses. Durbin-Watson statistics are not reported as they have no use in cross-sectional regressions unless the observations have been organized in groups to be tested for homogeneity. Equations (iv) through (vi) are estimated by instrumental variables, using 1970 values for *lnGDP* as instruments for *lnGDP50*. The dependent variable in each equation is the natural log of GDP per capita in 1990 minus the corresponding value for 1950. This normalization permits series in index form to be used comparably with those in lire, given that all observations for the same year are in the same units. The number of observations is reduced from 20 to 18 for the satisfaction equations since survey data are not available for the two smallest regions, Val d'Aosta and Molise, with populations of 115 and 328 thousand, respectively.

The trend line through the time series of standard deviations shows a significant break in 1983, as documented by the regression results reported in Table 2. With or without a break, the time series shows a significant downward trend over the 40 year period starting in 1950, although the observations for 1950 and 1960 confirm the absence of any convergence during the 1950s. In the context of our investigation of the effects of social capital and regional government reforms, it is appropriate to wonder if the increase in dispersion during the 1980s might be due to the increasing powers of the regional governments being used to greater effect in the regions with greater civic traditions.

**FIGURE 1**  
**Regional Income Dispersion**



Unfortunately, we do not have enough information about trends in institutional performance to directly test this hypothesis. However, we can at least see if the trends coincide, and then indirectly test whether the reforms in regional government are likely to have been responsible for the 1980s divergence of regional growth paths. Their timing looks fairly close. The legislation providing significant powers to the new regional governments was passed in 1977, and implementation generally followed the 1980 regional government elections. Allowing some time for the new regional government programs to be designed and implemented, and to start to affect economic growth, we might expect to find some effects on growth paths before the middle of the 1980s. If the regions with greater social capital were able to put their new powers to more effective use, we would expect to find growing (relative) citizen satisfaction and greater economic growth in those regions. Since the regions with greater social capital were already relatively rich, their greater growth would show up as a slowing or reversal of the convergence of income levels documented for the 1960s and 1970s. That is exactly what happened, as shown by the significant reversal of convergence starting in 1983, as pictured in Figure 1 and confirmed by equation (i) in Table 2.

As noted above, the lack of time series measures for the effectiveness of regional government makes it difficult to see whether it is more than coincidence that greater dispersion of incomes occurred when we expected more effective regional governments to start affecting economic growth. We can think of two ways of proceeding. One indirect strategy is to do a series of cross-sectional regressions on the single measures of civic traditions and governmental effectiveness, and see if higher values



**TABLE 2**  
**Estimated Trends in Regional Dispersion of**  
**Per Capita Incomes, 1950-1990**

Equation	(i)	(ii)	(iii)	(iv)	(v)
No. of Observations	23	23	23	23	23
Estimation Method	OLS	OLS	OLS	OLS	OLS
Dependent Variable	$\sigma y$	$\sigma \text{Civicsres}$	$\sigma \text{Perfres}$	$\sigma \text{Satisres}$	$\sigma \text{Satisres}$
Constant	.4991 (17.63)	.4416 (14.09)	.4763 (13.43)	.4780 (14.99)	.4720 (18.66)
<b>Coefficients</b>					
Year	-.00288 (7.58)	-.00448 (10.64)	-.00430 (9.42)	-.00343 (8.01)	-.00344 (10.31)
Year-83, if > 0	.00641 (3.79)	.00811 (4.32)	.00991 (4.67)	.00062 (0.33)	
R <sup>2</sup>	.722	.846	.787	.819	.827
S.E.E.	.0135	.0149	.0168	.0152	.0148
D.W.	1.90	1.48	1.20	1.82	1.79

Absolute values of *t*-statistics are in parentheses. The dependent variable in each equation is a time series of cross-sectional standard deviations. For equation (i), the standard deviations are of per capita incomes across 20 regions. In equations (ii) and (iii) the standard deviations are of the residuals from cross-sectional equations explaining regional income differences by either civic traditions (ii) or institutional performance (iii). In equations (iv) and (v) the residuals are from equations estimated across the 18 larger regions for which data are available from the surveys of citizen satisfaction. Equation (v) differs from equation (iv) only by excluding the insignificant second time trend.

of these measures are associated with higher dispersion of incomes during the 1980s. These tests reveal no significant trends. Thus we are not surprised, when we regress the residuals from these regressions on split time trends, as shown in equations (ii) to (iv) of Table 2, to find a significant split at the same point as for the raw measures of income dispersion.

A more direct and probably more appropriate test is provided by the measures of citizen satisfaction, available from several different years, both before and after the likely dates when the reforms would have started to affect economic growth. As shown by Putnam [1993, Figure 2.8], public satisfaction with regional government, even in 1977, was almost twice as high in the northern as in the southern regions of Italy. In both parts of the country, the subsequent increases in regional government powers apparently led to increases in citizen satisfaction, and the proportionate gap increased slightly. Further supportive evidence is that about 8 percent of southerners moved from the unsatisfied to the satisfied group between 1977 and 1988, while in the North more than 25 percent of those polled did so.

To get an idea of whether this greater perceived efficiency of regional government may have translated into higher growth in the already richer regions, we performed

cross-sectional regressions of regional income differences on the most recent previous measure of citizen satisfaction. We plot the standard deviations of the residuals from these regressions in Figure 1. We then tested whether these adjusted measures of income dispersion (standard deviations of the residuals) also increased during the 1980s, and found that they did not, as can be seen by comparing equations (iv) and (v) in Table 2. More directly, the series plotted in the lower half of Figure 1 show no sign of turning upward in the 1980s, and indeed keep the same downward trend estimated for the earlier decades.<sup>8</sup> We interpret this result as support for the idea that at least some part of the increased dispersion of per capita incomes during the 1980s was due to changes in the relative effectiveness of regional governments, as revealed by changes in greater citizen satisfaction with their regional governments. We are cautious about this inference, since it is based on a fairly slender amount of evidence, and the changes in citizen satisfaction may be due in part to other factors which caused the richer regions to grow faster during the 1980s.

## CONCLUSION

We confirm strong convergence of per capita incomes among the Italian regions during the 1960s and 1970s, and find significant evidence that convergence is faster, and equilibrium income levels higher, in regions with more social capital, using any of three measures — an index of the extent of civic community, an index of various direct measures of the effectiveness of regional government, or surveys of citizen satisfaction with their regional governments. We also find evidence of a sharp reversal of convergence from 1983 through 1990, as indicated by increasing dispersion among regions in the levels of real per capita GDP. Since this reversal of convergence occurred when the increase in regional autonomy was expected to start affecting economic performance, we believe the regional government reforms have been in part responsible. The direct measures of citizen satisfaction with regional government show greater post-reform increases in satisfaction in the North than in the South, and the regional growth rate differences after 1983 suggest that these perceived increases in the effectiveness of regional government also led to greater economic growth. If our view of conditional convergence is valid, then this divergence will be temporary, since the larger income gaps, and the associated differences in the effectiveness of government, will offer more good examples for the lagging regions to follow and will probably increase the demands from their citizens that they should do so. Both of our conclusions are consistent with Putnam's finding of pervasive influence of long-standing regional differences in social institutions and with his survey results showing much more effective regional governments in those regions with initially higher levels of social capital. Our results confirm his view that institutions matter, while also supporting a version of conditional convergence of productivity that makes catching-up a function of the size of the productivity gap between the richer and poorer regions.

Our conclusion that the regional government reforms have been responsible, at least in part, for the reversal of convergence in the 1980s is provisional and qualified. It is provisional because no doubt other possible reasons remain to be spelled out and

tested. The conclusion is qualified since only the satisfaction data provide clear indication that regions with better institutions grew faster in the aftermath of the regional government reforms. The earlier measures of civic community and government performance are not sufficient to predict which regions would have more satisfactory regional government (as seen by citizen surveys) and faster growth after 1983. The satisfaction data are more useful, since they are measured both before and after the regional government reforms were implemented, and hence have some chance of showing what effects the reforms had on the relative effectiveness of the various regional governments. Since we do not have comparable pre-reform and post-reform measures of institutional performance and social capital, determining which elements of social capital and institutional performance were most important in permitting the benefits of regional autonomy to be translated into faster growth in the 1980s remains for future research. That the increasing dispersion will be self-limiting, and possibly reversed, by the forces of conditional convergence, which should enable the poorer regions to once again start closing the gap in real incomes also remains to be confirmed.

### NOTES

Helliwell is Professor of Economics at the University of British Columbia and Research Associate of the National Bureau of Economic Research. Putnam is Clarence Dillon Professor of International Affairs at Harvard University and Director of Harvard's Center for International Affairs. The research was undertaken while Helliwell was Mackenzie King Visiting Professor of Canadian Studies at Harvard. An earlier version was presented at the Eastern Economics Association Annual Meetings in Boston, March 1994. We are grateful for suggestions received there from Chris Clague, Mancur Olson and others. A subsequent presentation at the University of British Columbia also produced many helpful suggestions, and the editor has provided many helpful editorial suggestions. For assistance in collecting and interpreting regional income data, we are grateful to Luigi Campiglio and Paulina Girsén.

1. Like Campiglio [1993] and SVIMEZ [1991, 39-40], we find that the recent divergence dates from 1983-84. Some other accounts, especially those focusing on the gross gap between South and North, place the turning point slightly earlier (in the mid-1970s)[Baussola and Fiorito, 1994, 498-99, and sources cited therein].
2. Between 1976 and 1981-82, the percentage of regional councillors who agreed that technical considerations should have more weight than political ones (in contemporary social and economic affairs) increased from 43 percent to 64 percent [Putnam, 1993, 33]. In the 1976 surveys, regional councillors' regional administrative contacts were twice as frequent as local ones. For the 1981-82 councillors, regional contacts were five times as frequent as local ones [Putnam, 1993, 43].
3. The turnout in referenda is used as a measure of citizen involvement, and hence of civic community. The incidence of preference voting in national elections is used as an inverse measure of civic community, since it is an option available to voters who choose to use it and is in fact used chiefly in regions where party labels are largely a cover for patron-client networks. Thus students of Italian politics have long used the incidence of preference voting as an index of patron-client politics [Putnam, 1993, 94].
4. We make below a further distinction between partial and complete convergence. With complete convergence, growth rates and levels move to equality in equilibrium. With partial convergence, equilibrium income levels differ by enough so that the gap-closing influence of conditional convergence is large enough to offset variables inducing divergence, so that growth rates tend to be equal while income levels are not. We assume here, consistent with the results of Helliwell and Chung [1991], Dowrick and Gemmell [1991], Coe and Helpman [1993] and others, that convergence is driven mainly

- by inter-regional or international flows of know-how, and not merely by differences in investment rates, the channel that is emphasized by Barro and Sala-i-Martin [1991] and Mankiw, Romer and Weil [1992].
5. In contrast to Mankiw, Romer and Weil [1992] and Barro and Sala-i-Martin [1991], we explicitly assume that convergence is likely to be due to inter-regional transfers of knowledge, and not to depend solely on differing physical investment rates with the same levels of productivity applicable in each region. Our broader view of convergence is consistent with a wide range of theory and evidence, including the technological transfer models of Grossman and Helpman [1991], the convergence of rates of growth of Solow residuals among industrial countries found by Helliwell and Chung [1991] and Dowrick and Gemmell [1991], the role for institutions found by Keefer and Knack [1993], and the R&D spillovers found by Coe and Helpman [1993]. The functional form chosen is one of those proposed by Nelson and Phelps [1966], and is also used by Eaton and Kortum [1994] in their study of technology diffusion.
  6. Alternatively, or additionally, it is possible to exploit the time series properties of relative growth rates by examining what happens to the regional dispersion of real incomes (to measure the extent of unconditional convergence, as done by Friedman [1992] and Blanchard [1991]) or to the dispersion of residuals from models explaining regional differences in terms of other variables (to examine the extent of conditional convergence, as recommended by Quah [1993]). Both methods will be used in the next section.
  7. The preferred measure is real per capita GDP at market prices, but for a number of years we have instead used value-added at factor cost. The former measure includes indirect taxes, while the latter does not. We find that the measures of dispersion tend to be slightly smaller for the factor cost estimates, suggesting that average indirect tax rates are lower in the poorer regions. We have tried to allow for the varying nature and quality of the regional income measures in two ways. First, we have done some tests making use of all the alternative measures that we have been able to find, including sometimes as many as three different measures for a single year. Second, we have in our regressions for the time series variation of income dispersion tested a variable representing years when a factor cost measure was used, to ensure than any of our other results are not affected by the unavailability of continuous series based on the same concepts of income. The results suggest that our conclusions are unaffected by the mix of income definitions.
  8. The outlying observation for 1986 would be brought completely into line if the cross-sectional regression were based on the satisfaction survey for 1987 rather than that for 1981-82, since the standard error of the equation would drop from .214 to .186 if the 1987 survey result were used. The 1987 measure is no doubt closer to the true 1986 measure than is the 1981-82 result. However, given the risk that the satisfaction survey responses may be influenced by prior growth, we continued to use the stale 1981/82 survey results to ensure that we never use survey responses collected after the year for which the income dispersion is being calculated.

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