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The GDP's of Three Regions in Western Europe, 1950–1990

Henri Theil and Sri Devi Deepak

We use the international comparison data of Summers and Heston to trace the development of three regions in Western Europe: the countries currently outside the European Union (EEC), the EEC Center, and the EEC Periphery (Greece, Ireland, Portugal, and Spain). For each year during the period 1950–1990, the per capita gross domestic products of these regions decrease in this order, but the development over time shows a rapid increase of all three regions as well as a mutual convergence, the inequality of the regions and their constituent countries declining substantially.

Key Words: convergence, GDP, inequality, purchasing power parity, Western Europe, World Penn Tables

The data of the International Comparison Project, based on purchasing power parities, enable the analyst to compare systematically the gross domestic products (GDPs) of different countries and regions over time. The objective of the present article is to illustrate this for Western Europe (i.e., non-Communist Europe) in the period 1950–1990. There are 18 countries constituting Western Europe, which we divide into three regions. One is non-European Union (non-EEC), which consists of six countries: Austria, Finland, Iceland, Norway, Sweden, and Switzerland. Another is the EEC Center, which consists of eight countries: Belgium, Denmark, France, Germany (West), Italy, Luxembourg, Netherlands, and the United Kingdom. The third is the EEC Periphery, which consists of four countries: Greece, Ireland, Portugal, and Spain.

Columns 2–5 of Table 1 show the per capita GDPs of Western Europe and its three re-

gions. These figures are obtained by weighting the per capita GDPs of the constituent countries proportionally to their populations. The figures in column 2 indicate that Western Europe's per capita GDP increased almost uninterruptedly from ~\$3,700 in 1950 to \$12,750 in 1990, or almost 250%. The next three columns show the differences between the three regions. In each year, the per capita GDP of non-EEC exceeded that of the EEC Center (columns 3 and 4), but the percentage difference declined from almost 18% in 1950 to 8% in 1990. Similarly, the figures for the EEC Periphery are lower, and indeed much lower, than those for the EEC Center in the same year. It took the Periphery until the mid-1960s to reach a per capita GDP equal to that of the Center in 1950 and until 1990 to reach the level that the Center reached in 1970. Nevertheless, here too we find convergence: in the early 1950s, the Periphery's per capita GDP was well below 50% of that of the Center, but in 1990 it was well above 60%.

The other columns of Table 1 pursue the matter of convergence more systematically. As a measure of the inequality among the per capita GDPs, we use the logarithm of the ratio

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Table 1. GDP Per Capita and International Inequality in Western Europe

Year (1)	GDP Per Capita*				Inequality		Average Within Region (8)
	All 18 Countries (2)	Non-EEC (3)	EEC Center (4)	EEC Periphery (5)	All 18 Countries (6)	Regional (7)	
1950	3,707	4,721	4,009	1,775	0.0683	0.0406	0.0277
1951	3,902	4,931	4,196	1,994	0.0598	0.0346	0.0251
1952	3,999	4,990	4,307	2,053	0.0563	0.0341	0.0222
1953	4,158	5,083	4,514	2,031	0.0578	0.0383	0.0196
1954	4,363	5,402	4,707	2,225	0.0548	0.0346	0.0202
1955	4,621	5,700	4,995	2,326	0.0544	0.0357	0.0188
1956	4,799	5,889	5,181	2,462	0.0522	0.0339	0.0183
1957	4,942	6,036	5,335	2,549	0.0505	0.0334	0.0171
1958	4,999	6,020	5,396	2,629	0.0472	0.0315	0.0157
1959	5,207	6,324	5,643	2,595	0.0506	0.0362	0.0144
1960	5,532	6,738	5,991	2,778	0.0493	0.0357	0.0136
1961	5,805	7,124	6,244	3,077	0.0437	0.0311	0.0127
1962	6,017	7,322	6,453	3,306	0.0408	0.0280	0.0128
1963	6,239	7,585	6,663	3,556	0.0369	0.0251	0.0118
1964	6,559	7,976	7,004	3,738	0.0380	0.0251	0.0130
1965	6,783	8,222	7,219	3,987	0.0358	0.0227	0.0131
1966	6,985	8,402	7,421	4,202	0.0333	0.0210	0.0124
1967	7,181	8,608	7,622	4,373	0.0306	0.0201	0.0105
1968	7,508	8,825	7,976	4,644	0.0285	0.0189	0.0097
1969	7,919	9,271	8,395	5,005	0.0277	0.0174	0.0103
1970	8,216	9,727	8,688	5,222	0.0275	0.0171	0.0104
1971	8,472	9,954	8,950	5,450	0.0248	0.0161	0.0087
1972	8,828	10,296	9,296	5,861	0.0226	0.0141	0.0085
1973	9,282	10,690	9,758	6,318	0.0196	0.0126	0.0071
1974	9,388	11,010	9,819	6,529	0.0185	0.0116	0.0069
1975	9,167	10,846	9,565	6,465	0.0183	0.0111	0.0072
1976	9,568	10,977	10,065	6,611	0.0188	0.0120	0.0068
1977	9,755	11,091	10,286	6,720	0.0185	0.0122	0.0062
1978	9,988	11,181	10,586	6,764	0.0190	0.0133	0.0057
1979	10,336	11,694	11,002	6,759	0.0205	0.0157	0.0490
1980	10,462	12,148	11,112	6,802	0.0208	0.0163	0.0045
1981	10,357	12,107	11,003	6,707	0.0210	0.0168	0.0042
1982	10,400	12,144	11,049	6,756	0.0204	0.0166	0.0038
1983	10,530	12,369	11,205	6,743	0.0214	0.0177	0.0037
1984	10,751	12,738	11,463	6,755	0.0231	0.0192	0.0039
1985	10,987	13,117	11,706	6,898	0.0231	0.0194	0.0037
1986	11,291	13,414	12,034	7,106	0.0229	0.0192	0.0037
1987	11,612	13,712	12,342	7,487	0.0210	0.0174	0.0036
1988	12,083	14,072	12,841	7,902	0.0199	0.0163	0.0036
1989	12,475	14,470	13,221	8,328	0.0186	0.0149	0.0037
1990	12,755	14,623	13,506	8,637	0.0179	0.0138	0.0041

* Expressed in 1985 international prices.

Table 2. Inequalities by Region

Year (1)	Inequality			Percentage Shares		
	Non-EEC (2)	EEC Center (3)	EEC Periphery (4)	Non-EEC (5)	EEC Center (6)	EEC Periphery (7)
1950	0.0521	0.0256	0.0240	17.2	68.7	14.2
1951	0.0490	0.0216	0.0280	17.8	63.9	18.3
1952	0.0478	0.0174	0.0297	19.7	58.3	22.0
1953	0.0479	0.0158	0.0211	22.4	59.9	17.7
1954	0.0438	0.0158	0.0272	19.8	58.1	22.1
1955	0.0377	0.0142	0.0286	18.4	56.5	25.1
1956	0.0396	0.0134	0.0286	19.8	54.4	25.7
1957	0.0373	0.0127	0.0261	19.9	55.1	25.0
1958	0.0315	0.0111	0.0280	18.3	52.5	29.2
1959	0.0337	0.0106	0.0209	21.4	54.8	23.7
1960	0.0292	0.0092	0.0251	19.5	50.2	30.2
1961	0.0307	0.0072	0.0275	22.1	42.3	35.6
1962	0.0316	0.0058	0.0345	22.4	33.6	44.0
1963	0.0314	0.0045	0.0342	24.3	28.2	47.5
1964	0.0307	0.0062	0.0341	21.6	35.5	43.0
1965	0.0284	0.0070	0.0323	19.8	40.0	40.3
1966	0.0259	0.0056	0.0357	19.1	33.9	47.1
1967	0.0256	0.0037	0.0328	22.2	26.6	51.1
1968	0.0257	0.0035	0.0288	24.3	26.9	48.8
1969	0.0241	0.0041	0.0312	21.3	29.3	49.4
1970	0.0235	0.0057	0.0246	20.6	40.8	38.7
1971	0.0222	0.0051	0.0178	23.3	43.4	33.4
1972	0.0191	0.0050	0.0186	20.5	43.9	35.6
1973	0.0171	0.0039	0.0159	21.9	41.4	36.7
1974	0.0154	0.0032	0.0193	20.2	34.2	45.6
1975	0.0108	0.0038	0.0206	13.6	38.9	47.5
1976	0.0084	0.0038	0.0192	11.2	41.2	47.6
1977	0.0075	0.0036	0.0168	10.9	43.4	45.6
1978	0.0076	0.0034	0.0145	12.0	44.5	43.4
1979	0.0062	0.0030	0.0120	11.4	46.3	42.3
1980	0.0067	0.0027	0.0111	13.4	43.9	42.7
1981	0.0072	0.0026	0.0094	15.3	46.0	38.7
1982	0.0060	0.0024	0.0088	14.1	46.1	39.8
1983	0.0055	0.0021	0.0097	13.2	40.8	45.9
1984	0.0057	0.0019	0.0110	13.1	36.9	50.0
1985	0.0062	0.0017	0.0110	15.0	33.4	51.6
1986	0.0072	0.0016	0.0111	17.2	30.6	52.2
1987	0.0068	0.0011	0.0125	16.8	22.7	60.5
1988	0.0056	0.0011	0.0129	14.2	22.3	63.5
1989	0.0052	0.0011	0.0138	12.7	21.6	65.7
1990	0.0045	0.0015	0.0149	9.9	26.7	63.4

* Percentage share of each region in the average within-region inequality.

of arithmetic mean income (mean GDP) to geometric mean income. When this measure is applied to the 18 countries of Western Europe, it can be written as

$$J = \sum_{i=1}^{18} p_i \log_e(p_i y_i)$$

where P_i is the population share and Y_i the income share of country i . The result is shown in column 6 and indicates a substantial decrease in inequality, from 0.068 in 1950 to 0.018 in 1990.

Given that we introduced three regions, it is appropriate that we apply the inequality measure at the regional level. Regional inequality is then defined as

$$J_R = \sum_{g=1}^{18} P_g \log_e(P_g Y_g)$$

where $P_g = \sum_i p_i$ and $Y_g = \sum_i y_i$ are the population and income shares of region R_g (sums over $i \in R_g$). The inequality among the countries of R_g is

$$J_g = \sum_{i \in R_g} \left(\frac{p_i}{P_g} \right) \log_e \left[\left(\frac{p_i}{P_g} \right) / \left(\frac{y_i}{Y_g} \right) \right],$$

and the relationship between the J s is then

$$J = J_R + \bar{J}$$

where

$$\bar{J} = \sum_{g=1}^3 P_g \log_e(P_g J_g)$$

with \bar{J} interpreted as the average within-region inequality.

Columns 7 and 8 contain J_R and \bar{J} ; they indicate that the regional component dominates. Regional inequality J_R declined from 1950 until the mid-1970s, after which it increased until the mid-1980s and then declined again. The average within-region inequality \bar{J} declined from 1950 until 1980, after which it became stationary.

Although the average within-region inequality is dominated by the regional inequality, it is nevertheless of interest to consider the former a little further. Columns 2–4 of Table 2 contain the inequalities J_g of the three separate regions. Initially, in 1950, the inequalities of the two EEC regions were about equal and that of non-EEC was twice as large, but this picture changed very soon. The inequalities of both non-EEC and EEC Center declined drastically, the 1990 figure being <10% of that of 1950 in both cases, but the behavior of the inequality among the EEC Periphery countries was quite different. From 1950 to 1970 this inequality was not subject to a declining trend, and it fluctuated between 0.021 and 0.035. During the remainder of the 1970s it was lower (between 0.012 and 0.021), and it was still somewhat lower in the 1980s although much larger than the inequalities of the two other regions during those years.

It follows from the definition $\bar{J} = \sum_g P_g J_g$ that we can regard $P_g J_g / \bar{J}$ as the share of region R_g in the average within-region inequality. These shares in percentage form are shown in the last three columns of Table 2. In the first two years (1950–1951) EEC Center accounted for about two thirds and the two other regions for about one half of the rest each. (We should note here that the population share of EEC Center was ~74% in 1950–1990, that of EEC Periphery 17%, and that of non-EEC 9%.) The share $P_g J_g / \bar{J}$ was subject to a declining trend, and it became about one quarter in the late 1980s. The share of non-EEC was stationary until the mid-1970s, after which it declined, whereas that of the EEC Periphery increased from <20% in the early 1950s to >60% in the late 1980s.

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