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Income distribution changes across the 1990s expansion: the role of taxes and transfers

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Abstract

We analyze the redistributive role played by governments during the 1990s expansionary economic cycle in several OECD countries. We find a duality among countries: while governments in the Euro-area play a crucial role in the redistributive process, government interventions reduce the equalitarian effect of the market in the Anglo-Saxon economies.

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1. Introduction

This paper examines the redistributive role played by governments during the 90s expansion which occurred at the same time in France, Germany, Italy, Spain, United Kingdom and United States.

The standard view in the literature is that economic cycles have potential impacts on income distribution affecting both poverty and the distribution of personal income. In addition, government spending may either exacerbate, mitigate, or even reverse the sign of these impacts. Smeeding (2006) shows that public transfer payments and taxes have poverty-reducing and equalizing effects for a particular year. However, these measures affect the evolution of poverty and inequality rates in different ways when we consider a period of time. In this context, Vitaliano and Mazeya (1989) have found that the top two quintiles lose out from the transfer process in the US expansion of the 80s.

Our empirical strategy separates between market-driven changes affecting income distribution and the role of government interventions through direct taxes and cash benefits. For that, our methodology focuses on two different definitions of income, *market income* and *disposable cash income*. Previous studies (e.g. Burkhauser et al., 1999) analyze income distribution changes over a particular period of time by using the *pre-tax and post-transfer income definition*. However, income defined in this way mixes the pure market effects of the business cycle with the government interventions through transfers paid during the period.

The results show a duality among countries. Governments of the Euro-area countries (France, Germany, Italy, and Spain) achieve significantly higher reductions in poverty and inequality than those obtained from the market. However, this is not the case of Anglo-Saxon governments. The UK government reduces the equalitarian effects of the market, and the US government does not react enough to offset the market-driven rises in inequality. Additionally, we find that the role played by transfer payments in the redistribution of income is significantly higher than the role played by taxes. In this context, another duality in the results arises. In contrast to the case of the Euro-area countries, Anglo-Saxon governments tend to reduce the average amount of transfers received by poor households. We support our results with point estimates of poverty and inequality and with non-parametric estimations of the income distributions, which gives more robustness to our conclusions.

2. Turning points, data and income definition

To capture the chronology of the 90s expansion for each country we use the peaks and troughs suggested by the Economic Cycle Research Institute (ECRI) and we fill in missing data by applying the standard Bry-Boschan method to national GDPs. Our resulting chronologies consider troughs in 1992 for the United States, in 1993 for the United Kingdom, France and Italy, and in 1994 for Germany and Spain with coincident peaks for all countries in 2000.

Our analysis uses *annual income* measured at the *household level* in representative national surveys. In the case of the United States, the study is based on data from *Current Population Survey's Annual March Demographic Supplement (CPS)* provided by the U.S. Bureau of the Census. In the case of the European countries, we use the *European Community Household Panel (ECHP)*. Both surveys include information about income for the previous year.¹

¹ The ECHP is a panel data while the CPS is cross-sectional; This is not an inconvenience since what we need is having a big enough sample size that represents each country population properly for each year included in the

To control for differences in the size and composition of the households, we assume that income is equally shared among the household members, and we apply to each household the scale of equivalence provided by the Eurostat that follows the European Community Household Panel.² Finally, we adjust the income series for inflation by using the International Monetary Fund Consumer Price Index (IMF-CPI) for all the countries in the analysis.

Our definitions of income distinguish between *market income* and *disposable cash income*.³ The former includes earnings, income from investments, private transfers (including child support), and private pensions. The latter includes all types of money income, except direct income taxes and payroll taxes, and all cash benefits as well as refundable tax credits such as the earned income tax credit in the United States. By comparing the *market income* with *disposable cash income*, we determine the effects of government spending via cash benefits or via direct taxes. This comparison is crucial for analyzing how government interferes in the redistributive process.

Previous articles have used these definitions of income for several purposes. Smeeding (2006) determine the antipoverty effects of social policy by comparing market income and disposable cash income for a particular year. Aaberge et al. (2002) draw a picture of income inequality and define market and disposable cash income to consider differences in labour market and social policies between the Scandinavian countries and the United States.

3. Empirical analysis

3.1. Point estimate measures of poverty and inequality

Our measure of poverty is the FGT (2.0) poverty index of Foster, Greer and Thorbecke (1984):

$$P_2 = \frac{1}{n} \sum_{i=1}^q \left(\frac{z - y_i}{z} \right)^2, \quad (1)$$

where n is the total number of households, y is the income of the household, and q is the number of households below the poverty line z .⁴ To test the null hypothesis of no-difference in poverty between the turning points, we computed the p -values by using the percentile method proposed by Mill and Zandvakili (1997).

In Table 1, considering the figures related to *market income*, we observe that the 90s expansion has led to significant poverty reductions in the UK.⁵ Lower reductions in poverty appear in Spain, US, and France. On the contrary, poverty increases significantly during the expansion in Germany and, to a lesser extent, in Italy.

analysis. In the case of the ECHP, although the survey is an input-harmonized longitudinal panel survey, there were some attrition problems, for example, in the case of Italy (see Brandolini et al., 2004). Using national survey data could be an alternative solution for solving this problem. In particular, for the case of Italy, the use of the Survey on Household Income and Wealth (SHIW) provided by the Bank of Italy could be an alternative solution. However, the ECHP does a better job than the SHIW in measuring income benefits and having a broad decomposition of the income cash benefits is one of the main objectives of this paper. For Germany and the UK, the ECHP data comes from their national surveys, the GSOEP and the BHPS, respectively.

² We attribute weights of 1.0 to the first adult in a household, 0.7 to all remaining adults, and 0.5 to each child.

³ The definitions of income used follow the indications of the U.S. Bureau of the Census: <http://pubdb3.census.gov/macro/032006/alttoc/toc.htm>. We sum all income variables after adjusting following Burkhauser et al. (2004).

⁴ Poverty lines are defined as the 50% of the median income.

⁵ The same point has been made in the work of Burkhauser et al. (1999) who also find bigger reductions in UK than in US for the 1990s expansion.

The role of government social policies in altering the market-driven effects on poverty during the expansion is examined in the last five columns by using the *disposable cash income*. According to Smeeding (2006), they show statistically significant poverty reductions between troughs and peaks. Of special interest are the cases of Germany and Italy, whose governments were able to offset the market poverty increases previously observed (poverty reductions of 62% and 43%). However, the case of UK is atypical since it is the only country for which the poverty reduction driven by the market is mitigated by the government intervention.

The panel at the bottom of Table I reports the results of the inequality analysis, using the Gini coefficient.⁶ Standard errors are computed by using the percentile bootstrapping methodology.⁷ The *market income* growth of the 90s expansion leads to lower inequality in the majority of countries. Exceptions to this equalitarian evolution are US and Germany, whose Gini coefficients grow by about 6% and about 4%, respectively.

Results for *disposable cash income* are presented in the next five columns from which we can highlight three aspects. Firstly, the German tax-transfer system offset the increase in inequality showed by the *market income*. Accounting for the effect of taxes and transfers, the Gini coefficient decreases by about 7% and the fall is statistically significant (p -value of 0.00). A similar pattern is followed by the Italian government whose tax-transfer system leads to statistically significant falls of the Gini coefficient. Secondly, the UK does not follow the pattern of other European countries. Adding direct taxes and cash transfers to the definition of income mitigates the inequality falls from about 19% to about 14%. Hence, UK government interventions do not contribute to improving the equalitarian effect of the market as in the Euro-area countries. Finally, US is the only country for which the disposable income inequality has widened. The Gini coefficient rises by about 8%, and the growth is statistically significant (p -value of 0.00). The US tax-transfer system has not been able to offset the increment in market inequality that occurred in the 1990s expansion. On the contrary, government interventions exacerbate the inequality generated by the market.

3.2. Kernel density estimates of income distribution

As a robustness check of the previous results, we use the methods of Gaussian adaptive kernel estimation proposed by Burkhauser et al. (1999). Following these authors, we consider the lower and upper crossing points between the trough and the peak kernel density estimations to define the left and right-hand tails of the income distribution. Using these crossing points, we compute the estimated probabilities (P_p^j and P_t^j) that randomly indicate that a chosen household will have an income either in the lowest tail ($j=L$) or in highest tail ($j=H$) of the peak and trough income density functions, respectively. The difference between the two probabilities computed for each tail allows us to determine, by using a Binomial test, whether the density masses in the tails change across the period we are studying.

We start by showing the results for *market income*. In France and UK the proportion of population contained in the left-hand tail drops while that contained in the right-hand tail increases in UK and remains unaltered in France. On the contrary, Germany, US, Italy, and Spain exhibit changes that are basically movements toward the lowest tail of the distribution. However, the increases in the proportion of richer households are relatively lower, being only

⁶ With Theil I0 and I1 we found the same conclusions. See Sen (1973) for more details.

⁷ The poor performance of the bootstrap for inequality measures is noticed by some authors (see Davidson and Flachaire, 2007), since income inequality measures are affected by the extreme values of the distribution. To check the validity of our results, we also compute asymptotic standard errors (following Cowell, 1995) which slightly differ from those obtained by using bootstrapping methods.

significant for US. This helps us to explain the increase in income inequality detected by the point estimate measures of inequality in US.

Results for *disposable cash income* are in the lower panel of Table II. First, the UK government failed to improve upon the equalitarian effect that the market has on income distribution since the increase in the proportion of richer households is lower (0.10 versus 0.01) compared with the case of market income, and the proportion of poorer households increases. Second, for Germany and Italy the differences in the masses in the lowest tails turn to negative, although the changes are only marginally significant. In addition, the rises in the proportion of richer households are almost negligible (differences of 0.003 and 0.002) and they are not statistically significant at any standard level. Comparing with the market income results, this reinforces the redistributive role of their governments previously shown by the point estimates. Direct taxes and cash transfers also have positive effects in terms of income distribution in Spain and France. Finally, a significant proportion of US households in the middle of the distribution became poorer while the variation in the proportion of rich households is much lower. Hence, the US government did not offset the rises in income inequality produced by the market forces.

3.3. Driving factors behind income distribution changes

The previous results deserve one additional comment regarding whether either *direct taxes* or *cash transfers* are more important in the government redistribution process. Table III reports the differences between peaks and troughs for market income (first column), post-taxes and pre-transfers income (second column), pre-taxes and post-transfers income (third column), and disposable income (last column) and shows that the biggest changes arise when we add cash transfers to market income, being the effect of adding direct taxes negligible.

Finally, Table IV presents the average amount of transfer payments received by poor households across the trough-peak years. For the Euro-area countries, the average amount of cash transfers increases. The increments range from 7.8% in Spain to 48.1% in Germany. However, in the Anglo-Saxon countries, the quantity of cash transfer income received by poor households decrease about 2% and 0.8% in the cases of UK and US, respectively.⁸ This difference between the Euro-area and the Anglo-Saxon countries can explain the negligible reaction of the Anglo-Saxon governments against the market-driven redistribute effects of the 1990s expansion.

4. Conclusion

We examine the trend followed by the income distributions during the 90's expansion in United Kingdom, United States, France, Germany, Italy, and Spain. For this purpose, we follow an empirical strategy that compares market income and disposable cash income in troughs and peaks. The main purpose was to discriminate income distribution changes that come from real economy movements from those that are due to government cash benefits. This type of analysis is crucial to examine the role of government expenditure during an economic expansion.

We find that in Euro-area countries, gains from economic growth over the 90's expansion were more equitably distributed after government interventions. By contrast, Anglo-Saxon countries do not improve upon the income redistributions that are due to the market.

⁸ Smeeding (2006) finds that the United States devotes by far the smallest of its resources to antipoverty income transfer programs in 2000. They spend less than 3 percent of GDP on cash and near cash assistance for the nonelderly. This amount is less a third for spending in Germany.

Additionally, we get that the role of cash transfer payments is significantly higher than the role of direct taxes. While the average amounts of cash transfer payments received by poor households increase in the Euro-area countries, Anglo-Saxon governments tend to reduce the amount.

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Table I: Point estimate measures of poverty and inequality.

	Market Income					Disposable Income				
	T	P	P-T	%	p-val	T	P	P-T	%	p-val
Poverty Analysis (FGT 2.0)										
United Kingdom	29.95	22.23	-7.72	-25.7	0.00	2.15	1.67	-0.48	-22.0	0.01
United States	15.38	14.45	-0.93	-6.05	0.00	4.35	3.94	-0.41	-9.34	0.003
Germany	20.57	22.93	2.36	11.4	0.001	2.06	0.79	-1.27	-61.6	0.00
Italy	25.41	25.79	0.38	1.43	0.63	3.94	2.23	-1.71	-43.3	0.00
Spain	27.57	26.80	-0.77	-2.79	0.33	2.14	1.77	-0.37	-17.4	0.06
France	25.10	24.30	-0.80	-3.17	0.26	2.51	1.31	-1.20	-47.7	0.00
Inequality Analysis (Gini Index)										
United Kingdom	0.67	0.54	-0.13	-18.8	0.00	0.38	0.33	-0.05	-13.7	0.00
United States	0.49	0.52	0.03	6.12	0.00	0.37	0.40	0.03	8.11	0.00
Germany	0.48	0.50	0.02	3.76	0.15	0.28	0.26	-0.02	-6.77	0.00
Italy	0.53	0.52	-0.01	-0.56	0.34	0.34	0.31	-0.03	-8.45	0.00
Spain	0.58	0.56	-0.02	-3.46	0.01	0.34	0.33	-0.01	-3.29	0.03
France	0.60	0.52	-0.06	-11.4	0.00	0.35	0.28	-0.07	-19.8	0.00

Notes: Columns labeled with T (P) refer to troughs (peaks). The reported p -values of the null that the differences in poverty indexes (P-T) are statistically significant have been computed by using the bootstrap procedure described in Mills and Zandvakili (1997).

Table II: Evolution of kernel distributions' tails.

	Left-hand tail				Right-hand tail			
	T	P	Diff	p-value	T	P	Diff	p-value
Market Income								
United Kingdom	0.14	0.06	-0.08	0.00	0.42	0.52	0.10	0.00
United States	0.03	0.16	0.13	0.00	0.05	0.06	0.01	0.00
Germany	0.21	0.24	0.03	0.00	0.17	0.19	0.02	0.01
Italy	0.09	0.12	0.03	0.00	0.04	0.04	0.0002	0.94
Spain	0.06	0.20	0.13	0.00	0.27	0.29	0.02	0.03
Disposable income								
United Kingdom	0.08	0.10	0.03	0.00	0.06	0.07	0.01	0.11
United States	0.17	0.27	0.10	0.00	0.05	0.06	0.01	0.00
Germany	0.03	0.02	-0.007	0.02	0.06	0.07	0.003	0.57
Italy	0.04	0.03	-0.006	0.08	0.07	0.06	-0.002	0.67
Spain	0.08	0.14	0.06	0.00	0.07	0.08	0.01	0.08
France	0.48	0.41	-0.07	0.00	0.52	0.59	0.07	0.00

Notes: Figures shown in columns T and P show the percentage of households enclosed in the corresponding tail for the corresponding turning point, trough (T) and peak (P). Columns labeled with Diff show the difference between those percentages.

Table III: Effect of taxes and transfers on poverty and inequality.

	Market Income	Including Taxes	Including Transfers	Disposable Income
Poverty Analysis (FGT 2.0)				
United Kingdom	-7.72	-7.86	-1.02	-0.48
United States	-0.93	-1.09	-0.27	-0.41
Germany	2.35	2.06	-1.31	-1.27
Italy	0.36	0.02	-1.50	-1.71
Spain	-0.77	-0.95	-0.20	-0.38
France	-0.79	0.96	-1.03	-1.20
Inequality Analysis (Gini Index)				
United Kingdom	-0.13	-0.09	-0.11	-0.05
United States	0.05	0.02	0.04	0.03
Germany	0.02	0.02	-0.02	-0.02
Italy	-0.01	-0.02	-0.02	-0.01
Spain	-0.04	-0.02	-0.02	-0.01
France	-0.06	-0.07	-0.07	-0.07

Notes: Figures show the difference between trough-peak point estimates of poverty and inequality.

Table IV: Average Transfers Income during the 90s expansion.

	T	P	Diff	%
United Kingdom	3862.91	3785.98	-76.93	-1.99
United States	2327.51	2308.62	-18.89	-0.81
Germany	8250.00	12221.92	3971.92	48.14
Italy	3781.63	4458.01	676.38	17.88
Spain	437090.2	471307.0	34216.8	7.83
France	30464.68	34654.68	4190	13.75

Notes: Column labeled by T (P) contains the average of transfer income received by poor households for the corresponding year. Diff means the difference between both trough-peak years, and % is the percentage of variation between trough and peak. Transfer incomes are evaluated in constant national currencies.