**Investigaciones
Regionales**

Unemployment and long-run economic growth: The role of income inequality and urbanisation

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ABSTRACT: Two of the most dramatic aspects of the current economic crisis are with no doubt the experience of high and persistent rates of unemployment and the accelerated pace at which inequalities increase. But high and persistent levels of unemployment and increasing inequality are more than a consequence of scarcer opportunities related to the crisis; they can also be negative determinants for subsequent long-run economic growth. In this work, we consider unemployment and income inequality, and interactions between both, as possible determinants of long-run growth by using cross-sectional international data. Our results suggest that: 1) while initial high unemployment rates do not seem to be statistically significant to explain long-run growth, they do have a negative and significant effect when interacting with increases in inequality. 2) When we differentiate based on levels of urbanization, increasing inequality harms growth in countries with high levels of urbanization, as well as in countries with low levels of urbanization in which there is high and persistent unemployment.

JEL Classification: J6, O1.

Keywords*:* Unemployment, urbanization, inequality, economic growth.

Desempleo y crecimiento económico a largo plazo: el papel de la desigualdad de ingresos y la urbanización

RESUMEN: Dos de los aspectos más dramáticos de la crisis económica actual son sin duda la experiencia de elevadas y persistentes tasas de desempleo y el ritmo acelerado al que las desigualdades aumentan. Sin embargo, niveles elevados y persistentes de desempleo y aumentos de la desigualdad son más que una consecuencia de oportunidades escasas relacionadas con la crisis; también pueden ser determinantes negativos para un crecimiento económico posterior a largo plazo.

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En este trabajo, utilizando datos internacionales de corte transversal, consideramos el desempleo y la desigualdad de ingresos, y las interacciones entre los dos, como posibles factores determinantes del crecimiento a largo plazo. Nuestros resultados sugieren que: 1) mientras altas tasas iniciales de desempleo no aparecen como estadísticamente significativas, sí tienen un efecto negativo y significativo cuando interactúan con aumentos en la desigualdad. 2) Cuando diferenciamos basándonos en niveles de urbanización, la desigualdad creciente perjudica el crecimiento tanto en países con altos niveles de urbanización, como en países con bajos niveles de urbanización donde hay desempleo alto y persistente.

1.   Introduction

Two of the most dramatic aspects of the current economic crisis are, with no doubt, the high and persistent rates of unemployment and the accelerated pace at which inequalities are increasing. According to International Labour Organization estimates, global unemployment reached 210 million people in 2010. The World of Work report 2011 (ILO, 2011), under the title «Making markets work for jobs», stressed that the current crisis has resulted in a global need of 80 million net new jobs over the next two years to restore pre-crisis employment rates. There is a vast literature on the causes and consequences of unemployment. However, little of this literature specifically provides scarce empirical evidence of the impact of unemployment on long-run economic growth [1]. Sala-i-Martin *et al.* (2004) list up to 67 variables potentially influencing long-run growth, but none of them is directly related to the labour market. In the present paper we examine whether high and persistent levels of unemployment can be considered a determinant of long-run economic growth.

The sign of the relationship between unemployment and long-run growth is unclear. Several works, such as Zagler (2009), assume that economic growth is driven by structural change, which usually has a cost associated with it in terms of unemployment because labour markets may not be flexible enough, leading to delays in the adjustment to such changes. Similarly, several works, *e.g.* Bassanini *et al.* (2009), report improvements in productivity associated to changes in the employment protection legislation. These changes promote higher labour market flexibility, which eventually encourage countries with initial high levels of unemployment to promote reforms, which, in turn, will promote higher economic growth. Conversely, today we see that a key consequence of high and persistent unemployment is increasing social discontent and the risk of social unrest, which is largely motivated by ensuing inequality (World of Work report, ILO, 2011). In fact, it is clear that high and persist-

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[1] Nickell (1990) surveys microeconomic and macroeconomic theories on unemployment.

ent unemployment is associated not only with higher poverty rates [2], but also with higher inequality, since the unemployed lose proportionally more than the employed (Nickell, 1990). Furthermore, many economists now underline the importance of increasing inequality over the past decades as a root cause of the current economic crisis (Stiglitz, 2009; Brescia, 2010; Rajan, 2010, among others). Countries that have seen soaring unemployment rates and levels of inequality during the current crisis could also be facing the prospects of slower recovery and lower long-run growth. In fact, the same ILO, 2011 Report highlights that «there is a vicious cycle of a weaker economy affecting job and society, in turn depressing real investment and consumption, thus the economy and so on». Yet, the Report also states «not enough attention has been paid to jobs as a key driver of recovery».

The final piece of the puzzle is increasing inequality as a possible symptom of economic growth. The classical theory of inequality and economic growth stresses the differences in the interaction between both variables during the different stages of economic development, differences being driven by the process of urbanization (Lewis, 1954; Kuznets, 1955; Harris and Todaro, 1976; Rauch, 1993). Inequality is expected to rise with early urbanization, to then fall back. Moreover, the process of urbanization may be related to increasing unemployment if the inflow of workers in the urban sector exceeds urban labour demand (Harris and Todaro, 1976). Thus, for low-urbanized countries, where there is still high rural-to-urban migration, increasing inequality is associated to rural-urban differentials. However, increasing inequality is also associated to the increasing urban unemployment rates, even when accompanied by growth of the urban employment, which is the so-called Todaro paradox (see Lall *et al.,* 2006 for a survey on the rural-urban migration models). The final relationship between unemployment and inequality will very possibly depend, therefore, on stage of economic development (associated to level of urbanization).

In this work, we consider the impact on economic growth of unemployment levels and increasing income inequality, and their interaction, at different levels of economic development as summarised by urbanisation levels. The paper is organized as follows: first, we revise theoretical links between unemployment and growth (section 1.1) and the theory and empirical evidence on the effects of inequality on growth (1.2). Section 2 presents the data and the empirical approach followed, while section 3 presents our results. Section 4 extends the analysis to focus on the role of urbanization. Finally, a conclusion is given in section 5.

1.1. Unemployment and long-run growth

Unemployment may be associated with structural change and subsequent economic growth. Here, we focus on the mechanisms through which high and persistent unemployment may directly hinder economic growth. In the short run, economic

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[2] A recent IBRD report (IBRD, 2005) identifies unemployment as the first characteristics that account for much of the variation in poverty rates among individuals at the Eastern Europe and Central Asia region.

growth and unemployment are inversely related along the business cycle. However, *structural* unemployment mainly depends on factors related to the characteristics of the labour market. Moreover, when unemployment becomes high and persistent there are economic costs that can become detrimental to long-run growth. Unemployment not only represents a high social cost for the individual, it also represents a high economic cost for the society (Sanchis-i-Marco, 2011).

In the first place, high unemployment implies an inefficient use of resources and wasted work, not performed by the unemployed, which can never be recovered. Secondly, high unemployment also implies a lower aggregate demand; not only is consumption lower, harming current growth, but private investment in physical and human capital is also reduced, harming future production capacities. In this line, Bean and Pissarides (1993) analyse how unemployment may have an adverse effect on growth through lower savings available for investment. On the other hand, Chaterjee and Corbae (2007) report welfare costs of the Great Depression unemployment through lower consumption in the long-run. In parallel to this, high unemployment increases fiscal burden, through lower income revenues and higher welfare spending. A higher fiscal burden is likely to reduce public investment and to increase public debt, which handicaps future growth capacities [3]. In the third place, unemployment can lead to an erosion of human capital; people unemployed for long periods may become de-skilled, as their professional skills become obsolete in an era of rapid technological change and associated rapidly changing job market (Pissarides, 1992). Martin and Rogers (2000) suggest that when growth is generated by learning-by-doing, short-term macroeconomic instability reduces human capital accumulation and therefore growth. Moreover, as unemployed workers become de-skilled, their chances of finding a new job in the future decrease, initiating a vicious cycle. The time dimension is present in the «unemployment hysteresis hypothesis», according to which small increases in unemployment may result in pockets of long-term unemployment, as long-term unemployed do not perform a hard search for jobs and therefore do not exercise sufficient downward pressure on wages (Layard, Nickell and Jackman, 1991). Relatedly, Andrienko and Guriev (2004) found that high unemployment results in liquidity constraints, restricting labour migration and resulting in persistent unemployment and lower economic growth. Finally, high and persistent unemployment erodes individual self-esteem and life satisfaction, and confidence in the society as a whole (Ochsen and Welsch, 2011). Lower confidence and socio-economic deprivation, exclusion and marginalisation from unemployment increase social dislocation, leading to unrest and conflict (ILO, 2011) and decreasing labour market performance (Mares and Sirovátka, 2005), thus harming long-run growth.

From an empirical point of view, and despite well-grounded theoretical reasons to do so, unemployment is seldom considered as a variable to enter in the classical

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[3] European countries like Spain, Greece and Portugal today are a clear example of this mechanism, by which higher unemployment has increased fiscal burden, public debt and, therefore, forcing contractive austerity policies harmful for subsequent growth.

long-run growth regressions a-lá Barro and Sala-i-Martin. Still, some evidence can be found; for instance, the already mentioned work by Martin and Rogers (2000) reports a negative and significant impact of average unemployment rate on subsequent economic growth for industrialized countries and also for European regions. Yet, they consider that the impact goes via learning-by-doing and capital accumulation. For developing countries they do not find a significant impact and argue that this is explained by the fact that growth is driven by learning-by-doing only at late stages of development. However, we have seen that the negative impact can be brought about through other mechanisms aside from simply human capital accumulation and that they may also be at work in developing countries. In particular, we focus on the possibility that high and persistent unemployment may be associated to higher inequality and social unrest that are likely to harm long-run economic growth.

1.2. The effects of income inequality on economic growth

By contrast to the scarce literature on unemployment and long-run growth, there is a wealth of studies, both theoretical and empirical, on the relationship between inequality and economic growth. Several works demonstrate a significant negative relationship between inequality and long-run economic growth (Alesina and Rodrik, 1994; Persson and Tabellini, 1994; Clarke, 1995; Perotti, 1996; Temple, 1999; and Easterly, 2007; among others) based on cross-section analyses of international data[4]. Other authors have argued that it is important to look not only at levels of inequality across countries, but at how inequality evolves over time within countries (Forbes, 2000; Banerjee and Duflo, 2003; Castells-Quintana and Royuela, 2011). The negative effects of high and increasing inequality on long-run growth are thought to work through several transmission channels[5]. Moreover, many of these transmission channels linking inequality and growth discussed in the literature refer precisely to the arguments supporting a negative influence of unemployment on long-run growth. First, one channel connects high inequality to reduced productivity of certain assets and implies that many individuals do not have the opportunity to be more productive, which represents an inefficient use of resources. Second, high inequality also implies a higher share of population with low purchasing power, which, given that the poor tend to demand local products, reduces aggregate demand (Todaro, 1997). Third, inequality generates redistributive pressure, which may lead to economic distortions and disincentives that harm growth, such as social security programs that prevent labour migration from lagged regions to more prosperous ones, making unemployment and stagnation more persistent. Finally, higher inequality increases the risk of socio-political instability and conflict, which translates into uncertainty in property rights and reducing investment (Alesina and Perotti, 1996).

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[4] Benabou (1996) reviews some of the pre-1996 literature in depth.
[5] Both Barro (2000) and Ehrhart (2009) provide theoretical reviews on the various transmission channels through which inequality may influence long-run growth.

Therefore, since the factors that provide the theoretical base to expect that high and persistent unemployment will reduce growth seem to be closely associated to inequality, and since unemployment is likely to lead to increasing inequality, we should expect that the negative impact of high unemployment rates on long-run growth will be more relevant when high and persistent unemployment is linked to increasing inequality. These issues are clearly associated with institutional quality in all countries, both affecting the labour market (as stressed by Feldman, 2004) and the society as a whole, with ensuing effects on economic growth (as stressed by Knack and Keefer, 1995; Mauro, 1995; and Acemoglu, Johnson and Robinson, 2001; 2002). In this paper we assume that these institutions have a substantial effect on unemployment and inequality [6]. However, we have focused on the latter by considering a reduced form of a wider model in which institutions would have effects on unemployment and inequality, and all three would impinge on economic growth. In this way we concentrate our analysis on those channels through which institutions may affect economic growth. Our analysis was performed considering the different stages of development described in the Kuznets inverted-U hypothesis of inequality, from rural to urbanised societies once a structural change from agriculture to industry is accomplished.

2. Data and empirical approach

The experience and evolution of a previous recent major world crisis, that of the end of 1970s and beginning of the 1980s —without entering in a deep comparative analysis of both crises, which would be beyond the scope of this paper— give us a good opportunity to study empirically whether high and persistent unemployment rates combined with increasing inequality did indeed reduce long-run growth. As with today's crisis, unemployment rates soared in the early1980s. Along with increasing unemployment, there was also a significant increase in income inequality (as data from our sample shows: see section 2.1). We used cross-sectional international data from 1980 onwards to estimate a growth equation in which we analyse long-run effects of initial levels of unemployment and income inequality. We also chose the 1980s as our starting point because of availability of unemployment data.

Our empirical approach was based on a neo-classical model of economic growth. The empirical literature on economic growth has identified a substantial number of variables that are partially correlated with the long-term rate of economic growth. Sala-i-Martin *et al.* (2004), using Bayesian Averaging of Classical Estimates, found that of 67 explanatory variables tested, 18 were significantly and robustly partially correlated with long-term growth. Among those with the strongest evidence they found initial level of real GDP per capita and two variables associated with labour and capital endowments: primary school enrolment and the relative price of investment. In the

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[6] Inequality levels have a very high correlation with institutional quality; for our sample (excluding Mauritania because of lack of data) we found a correlation of –0.65 between inequality levels in 1980 and the «Quality of Government Index» in 1984/1985, the first years for which data are available. (The Quality of Government Index is taken from ICRG indicators of the PRS Group).

short list of important variables they also included regional dummies and a few other measures of human capital and health, such as life expectancy at birth[7]. In order to avoid running several million regressions, we followed a parsimonious strategy, and focus on the above-mentioned concepts, plus those specific to this paper: inequality and unemployment.

2.1. Data

We used GROWTH as our dependent variable, which reflects accumulated annual average per capita GDP growth rate between 1990 and 2007. A table with the definition and sources of all the variables considered is displayed in Annex 1[8]. We controlled for the initial level of per capita GDP in logs (LOG_PCGDP), the initial level of years of schooling (SCHOOLING), the initial price of investment (PI), the initial life expectancy at birth (LIFE_EXP) and the initial level of Gini coefficient (INEQUALITY). For unemployment we considered the average annual rate of unemployment during the period covering 1980 to 1989 (UE_MEAN) and the maximum annual rate of unemployment during the same period (UE_MAX). In this way we expected to capture long-run structural unemployment and control for the business cycle. For increasing inequality we considered the change in the Gini coefficient between 1980 and 1990 (ΔINEQUALITY). Data for inequality and for unemployment are very scarce. For unemployment we found very few countries with data on a year-to-year basis during the 1980s. The average and the maximum values were therefore computed only considering the years for which there were data for each country. For inequality we relied on Gruen and Klasen's (2008) adjusted Gini coefficients. These coefficients are from the World Income Inequality Database (WIID-WIDER), are adjusted to match the object under measurement, measuring households or families in the entire population, and have been previously used by us (Castells-Quintana and Royuela, 2011) and others, like Atkinson and Brandolini (2010). Finally, we also considered the ratio of urban population as percentage of the total population (URBAN), to classify countries at different stages of development. Considering data available our sample includes 48 countries (39 when we further consider ΔINEQUALITY). A list of the countries considered is in annex 2[9].

Table 1 shows descriptive statistics for our variables. Mean value and variance across countries in our sample were both high for any of the unemployment measu-

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[7] Given the short list of countries in our database we do not include regional dummies in our model. Nevertheless we will consider two different regressions depending on the degree of urbanisation, acting as control in this regard.

[8] In order to test the robustness of our results, we considered other variables related with labour (primary and secondary enrolment rates) and capital (the share of investment over total GDP, plus a measurement of the foreign direct investment, as a proxy for capital markets), both for 1980 and 1990. The final results, not reported here, basically confirmed what is here displayed and even though reported statistically more significant outcomes. Thus, we followed the parsimonious strategy of considering the Sala-i-Martín *et al.* (2004) preferred variables, as the main conclusions hold.

[9] Our 39 countries sample includes: 14 countries from Europe, 10 countries from Latin America and the Caribbean, 10 from Asia, 2 from North America, 2 from Africa, and 1 from Oceania (Australia).

Table 1. Descriptive statistics

	Mean	*Std. Dev.*	*Maximum*	*Minimum*	*Obs.*
GROWTH (1990-2007)	2.2341	1.4763	–0.4081	8.6207	48
LOG_PCGDP (1990)	9.0914	0.9220	7.3878	10.6841	48
LIFE_EXP (1990)	70.1710	6.2409	54.0570	77.5368	48
SCHOOLING (1980)	5.5152	2.7163	1.2000	11.9070	48
PI (1990)	70.9618	34.4676	23.0961	187.9749	48
UE_MEAN (1980-1990)	8.4596	5.2133	1.5333	25.8000	48
UE_MAX (1980-1990)	10.5479	5.8848	1.8000	27.3000	48
INEQUALITY (1990)	43.8042	9.8870	27.6000	62.1000	48
URBAN (1990)	61.2125	18.7873	19.8000	96.4000	48
INEQUALITY (1980)	43.4313	9.1575	27.3000	62.4000	48
Δ INEQUALITY (1980-1990)	0.4590	5.0367	–11.5000	10.9000	39

res. A high variance of inequality levels across countries was also found. Moreover, despite a sample mean increase of 0.46, increases in inequality from 1980 to 1990 showed even higher variance (ranging from a maximum decrease of 11.5 to a maximum increase of 10.9). The mean level of urbanisation was close to 60% and variance among countries for this variable was even higher than for inequality.

Table 2 presents the correlation values among the variables. Unemployment in the 1980s was negatively correlated to subsequent growth; the correlation was –0.32 using UE_MEAN and –0.28 using UE_MAX. In fact, among the considered explanatory variables —standard in the literature—, these two were the ones with higher correlation with economic growth. Similarly, inequality was negatively correlated with subsequent growth (–0.21). Additionally, there was a high and negative correlation of inequality levels with income levels (–0.54). Unemployment in the 1980s and inequality in the year 1990 were positively correlated (0.26 using UE_MEAN and 0.32 using UE_MAX). Regarding urbanisation levels, they were negatively correlated with growth (–0.22), but were also negatively correlated with inequality levels (–0.34) and with change in inequality (–0.11).

When we classify countries (high, low) according to level of urbanisation as compared to the sample median (60%), countries with high initial urbanization levels had on average an initial Gini coefficient of 40, while those with low initial urbanization had on average a coefficient of 48. Moreover, for the latter countries, inequality increased between 1980 and 1989 (a mean increase of 1.65 of the Gini coefficient), while it decreased for countries with high initial levels of urbanisation (a mean decrease of 0.79). For both types of countries, however, the levels of unemployment were similar; the mean was 7.94 for countries with low urbanisation and 8.98 for countries with high urbanisation (although there was higher variance among the former). The negative correlations between unemployment in the 1980s and growth were stronger for countries with low urbanization levels. Change in inequality between 1980 and

Table 2. Correlations

	GROWTH	*LOG_PCGDP*	*LIFE_EXP*	*SCHOOLING*	*PI*	*UE_MEAN*	*UE_MAX*	*INEQ.*	*Δ INEQ.*
GROWTH (1990–2007)	1								
LOG_PCGDP (1990)	–0.11	1							
LIFE_EXP (1990)	0.04	0.9	1						
SCHOOLING (1980)	0.05	0.82	0.77	1					
PI (1990)	–0.09	0.57	0.42	0.47	1				
UE_MEAN (1980-1990)	–0.32	0.06	0.12	–0.08	–0.14	1			
UE_MAX (1980-1990)	–0.28	0.04	0.12	–0.06	–0.17	0.98	1		
INEQUALITY (1990)	–0.21	–0.54	–0.42	–0.48	–0.56	0.26	0.32	1	
ΔINEQUALITY (1980-1990)	0.01	–0.10	–0.01	–0.09	–0.33	0.09	0.15	0.46	1
URBAN (1990)	–0.22	0.8	0.7	0.76	0.53	0.11	0.12	–0.34	–0.11

Included observations: 39

1990, by contrast, was negatively correlated (–0.23) with growth in countries with high urbanisation, while a weakly positive correlation (0.06) was found for countries with low urbanisation. Additionally, the correlation between unemployment (using UE_MAX) and change in inequality, although low, was higher (0.18) for countries with low than for countries with high levels of urbanisation (0.04).

2.2. Empirical approach

Our basic model can then be expressed as follows:

$$\Delta y_0^1 = c + \alpha_0 (y_{i0}) + \alpha_1 (ue_{i0}) + \alpha_2 (i_{i0}) + (X'_{i0})B + u_i \qquad (1)$$

Where Δy_{i0}^1 is the growth rate of per capita GDP (y_{i0}), is initial per capita GDP i_{i0}, is inequality (ue_{i0}), is one of our two variables for unemployment and (X) the considered control variables (price of investment, life expectancy and average years of

schooling). We used initial values of all our independent variables, as we wanted to estimate long-run effects and minimise endogeneity concerns.

From equation 1 we set different specifications. For inequality levels we started with 1980s values. We considered separately our 2 measures of unemployment during the 1980s: UE_MEAN (specification 1) and UE_MAX (specification 2). We then dropped the unemployment measures and considered change in inequality between 1980 and 1990 (specification 3). We finally considered the interactions between change in inequality during the 1980s and unemployment during the same period (specifications 4 and 5). All specifications were made by OLS estimation with robust standard errors.

3. Results

Table 3 presents the results for all our specifications. All controls have the expected sign. Results are consistent with conditional convergence; initial per capita GDP had a negative and significant coefficient on growth. Higher human capital levels (higher average years of schooling and higher life expectancy at birth) and the initial price of investment display non-significant parameters, although with the expected signs. Inequality had a significant negative effect on subsequent long-run economic growth. Regarding unemployment, none of the two measures considered seem to have a significant effect on growth. Changes in inequality were not significant. However, when we let unemployment interact with changes in inequality (specifications 4 and 5) the interaction term is negatively significant for any of the two variables for unemployment.

Results suggest, therefore, that higher unemployment, when associated to increasing inequality, has a negative effect on subsequent long-run economic growth [10]. Employment is at the core of recovery and long-run growth. And it is so in particular because high and persistent unemployment most probably leads to increasing inequalities that erode growth capacities. On the contrary, when inequality decreases and this decrease is coupled with large unemployment levels, we understand that this relationship could be associated to the early stages of development, when urbanisation is still taking place and high unemployment levels are due to a strong inflow of workers to the cities (as in Harris and Todaro, 1976, and Rauch, 1993). In any case, in our sample we did not find any country with the concurring circumstances of strong inequality decreases and high unemployment levels. However, we did find the opposite situation, i.e. increases in inequality linked to increases in unemployment. Overall, our results point to a strong negative impact of increasing inequality in association with high levels of unemployment: the third quartile of this interaction

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[10] 10 out of 10 of the worst performing countries in our 39 countries sample experienced high initial unemployment, increasing inequality or both (5 out of 10). By contrast, none of the 10 best performing countries experienced high initial unemployment and increasing inequality, while 8 experienced low initial unemployment and even 3 of them also experienced decreasing inequality (Malaysia, Norway and Indonesia).

Table 3. OLS estimations

Dependent Variable: GROWTH (1990–2007)					
Variable	*1*	*2*	*3*	*4*	*5*
	Coeff.	*Coeff.*	*Coeff.*	*Coeff.*	*Coeff.*
LOG_PCGDP (1990)	−1.5367 * (0.838)	−1.6015 * (0.869)	−1.8267 (1.087)	−1.8659 * (1.045)	−1.8801 * (1.062)
LIFE_EXP (1990)	0.1657 ** (0.078)	0.1724 ** (0.081)	0.1676 (0.103)	0.1641 (0.100)	0.1661 (0.101)
SCHOOLING (1990)	0.0903 (0.093)	0.1044 (0.093)	0.1250 (0.092)	0.1436 (0.089)	0.1415 (0.089)
PI (1990)	−0.0028 (0.006)	−0.0028 (0.006)	−0.0034 (0.006)	−0.0039 (0.005)	−0.0036 (0.006)
INEQUALITY (1980)	−0.0712 * (0.038)	−0.0699 * (0.039)	−0.0807 * (0.042)	−0.0822 * (0.042)	−0.0804 * (0.042)
UE_MEAN (1980–1990)	−0.0515 (0.035)				
UE_MAX (1980–1990)		−0.0342 (0.033)			
ΔINEQUALITY			−0.0404 (0.031)		
ΔINEQUALITY*UE_MEAN				−0.0077 * (0.004)	
ΔINEQUALITY*UE_MAX					−0.0056 * (0.003)
CONSTANT	7.8041 * (4.342)	7.7162 * (4.345)	10.2659 ** (4.927)	10.8906 ** (4.821)	10.7991 ** (4.858)
Obs.	48	48	39	39	39
R-sqd.	0.302	0.288	0.298	0.328	0.320

Estimation by OLS.
Robust standard errors in brackets. Asterisks indicate significance: *** 1%, ** 5% and * 10%

between the two variables (UE_MEAN equal to 11.065 and ΔINEQUALITY equal to 4) implies a decrease in GDP per capita of 3.8% over the 17 years considered.

4.   The role of urbanisation

We considered URBAN, the ratio of urban population as percentage of the total population, and classified countries in low and high in a comparison to the sample median (60%). We have seen that countries with low levels of urbanisation are in general terms less developed countries —likely to have a poorer institutional environment—. Additionally, we found that high inequality had worse effects in less, rather than in more, developed countries (Partrigde, 1997; Barro, 2000; Easterly, 2007). More developed countries tended to have lower levels of inequality very likely linked to the better institutional envi-

ronments and social welfare systems allowing them to tolerate, at least temporarily, high levels of unemployment without any significant increase of inequality. When inequality does increase it is less expected to be associated with economic development in these developed countries, as it might be the case in countries at earlier stages of development.

Thus, our previous results suggest that high and persistent unemployment has a negative effect on growth, but that this effect seems to be evident only when associated to increasing inequality. On the other hand, there are sound reasons to expect urbanisation to play a role in the effects of both inequality and unemployment on long-run growth. It seems reasonable, therefore, to wonder whether these links differ depending on the countries' level of urbanisation —as a component of the process of development but also as an indicator of it—. Thus, we extended our previous empirical analysis by differentiating countries according to their level of urbanization. Table 4

Table 4.   OLS estimations for highly urbanised countries

Dependent Variable: GROWTH (1990-2007)					
	1	2	3	4	5
Variable	*Coeff.*	*Coeff.*	*Coeff.*	*Coeff.*	*Coeff.*
LOG_PCGDP (1990)	–0.6528 (0.808)	–0.7022 (0.910)	0.2869 (0.762)	0.0803 (0.846)	0.112 (0.826)
LIFE_EXP (1990)	0.2145 * (0.115)	0.2259 * (0.127)	–0.1247 (0.086)	–0.1084 (0.094)	–0.113 (0.091)
SCHOOLING (1990)	0.0628 (0.130)	0.0829 (0.136)	0.0807 (0.112)	0.1153 (0.108)	0.1117 (0.106)
PI (1990)	–0.0175 (0.012)	–0.0173 (0.013)	–0.0154 * (0.008)	–0.0137 (0.009)	–0.0139 (0.009)
INEQUALITY (1980)	0.0097 (0.049)	0.0188 (0.051)	–0.0561 (0.052)	–0.0542 (0.053)	–0.055 (0.053)
UE_MEAN (1980-1990)	–0.1036 (0.065)				
UE_MAX (1980-1990)		–0.0684 (0.063)			
ΔINEQUALITY			–0.0632 * (0.029)		
ΔINEQUALITY*UE_MEAN				–0.0066 (0.004)	
ΔINEQUALITY*UE_MAX					–0.0058 * (0.003)
CONSTANT	–5.8074 (10.200)	–6.8226 (10.510)	11.6794 (10.021)	12.0149 (10.072)	12.1221 (9.988)
Obs.	24	24	19	19	19
R-sqd.	0.297	0.244	0.381	0.338	0.355

Estimation by OLS.
Robust standard errors in brackets. Asterisks indicate significance: *** 1%, ** 5% and * 10%.

presents the results for countries with low levels of urbanisation, while table 5 presents results for countries with high levels of urbanisation.

Results are similar to those in Table 3. However, comparing table 4 and 5, levels of inequality had a significant effect on growth only in countries with relatively low levels of urbanisation (Table 5), while the variable change in inequality was significantly negative for countries with relatively high levels of urbanization (specification 3 in Table 4). Regarding the interaction between unemployment and increasing inequality, the effect on growth was negative in both types of countries. But for countries with high levels of urbanisation the effect on growth was significant only when UE_MAX was used as the measure for initial unemployment. Moreover, the effect on growth was weaker than in low-urbanised countries; the coefficients in highly urbanised countries were about half those in low-urbanised countries.

Table 5. OLS estimations for low-urbanised countries

	Dependent Variable: GROWTH (1990-2007)				
	1	*2*	*3*	*4*	*5*
Variable	*Coeff.*	*Coeff.*	*Coeff.*	*Coeff.*	*Coeff.*
LOG_PCGDP (1990)	−1.1444 (1.404)	−1.2104 (1.406)	−2.3751 * (1.311)	−2.1847 * (1.217)	−2.2839 * (1.261)
LIFE_EXP (1990)	0.1258 (0.136)	0.1324 (0.137)	0.2397 (0.143)	0.2056 (0.128)	0.2146 (0.131)
SCHOOLING (1990)	0.2523 (0.257)	0.2643 (0.256)	0.4166 * (0.230)	0.4519 * (0.233)	0.4355 (0.248)
PI (1990)	0.0056 (0.006)	0.0054 (0.006)	0.0051 (0.007)	0.0056 (0.007)	0.0065 (0.007)
INEQUALITY (1980)	−0.116 ** (0.051)	−0.1146 ** (0.051)	−0.129 ** (0.052)	−0.1256 ** (0.051)	−0.118 ** (0.051)
UE_MEAN (1980-1990)	−0.0506 (0.034)				
UE_MAX (1980-1990)		−0.0426 (0.033)			
ΔINEQUALITY			−0.1195 (0.080)		
ΔINEQUALITY*UE_MEAN				−0.0152 * (0.007)	
ΔINEQUALITY*UE_MAX					−0.0106 * (0.005)
CONSTANT	8.2486 (5.874)	8.2742 (5.891)	10.853 * (5.897)	11.2624 * (5.561)	11.1711 * (5.724)
Obs.	24	24	20	20	20
R-sqd.	0.498	0.493	0.535	0.577	0.552

Estimation by OLS.
Robust standard errors in brackets. Asterisks indicate significance: *** 1%, ** 5% and * 10%

These results suggest, as expected, that the negative impact of inequality is highly dependent on the country's stage of economic development, and consequently on the institutional environment. In countries with lower levels of urbanisation —which we know tend to have lower levels of economic development— the negative effects of high levels of inequality on subsequent growth become significant. However, in these countries, and controlling for levels of inequality, the process of urbanisation and development is likely to be associated to *increasing* inequality (in line with Lewis, 1954; and Kuznets, 1955) [11]. Yet, increasing inequality in poor institutional environments —where inequality is already high— combined with high and persistent unemployment (our interaction term) leads to a significantly negative impact on long-run economic growth, this impact being double that in the more urbanised countries and that estimated for the full sample. In the more urbanised countries, increasing inequality is less likely to be linked to the process of economic development. Our results suggest that in these countries, although the levels of inequality have not significant impact on growth, increasing inequality will likely harm long-run growth.

5.   Summary and Conclusions

High and persistent unemployment is likely associated to increasing inequalities. Furthermore, there are sensible reasons to expect that this process of high and persistent unemployment, in which inequality increases, has a negative effect on subsequent long-run economic growth. In this paper we have studied the combined effects of unemployment and increasing inequality on economic growth. We have also extended our analysis to differentiating countries based on their levels of urbanisation. Our results suggest that: 1) while initial high unemployment rates do not seem to be significant for subsequent long-run growth, they do have a significantly negative effect when interacting with increases in income inequality. 2) When we differentiate based on levels of urbanisation, increasing inequality harms growth in countries with both high and low levels of urbanisation, although the effect is much stronger in the latter than in the former. In sum, unemployment may seriously harm growth not only because it is a waste of resources, but also because it has serious distributional effects: it generates redistributive pressures and subsequent distortions; it depreciates existing human capital and deters its accumulation; it drives people to poverty; it results in liquidity constraints that limit labour mobility; and finally it erodes individual self-esteem and promotes social dislocation, unrest and conflict. We have not been able to identify these channels, but we believe that our «reduced form» empirical model captures the main ideas of our discourse. Likewise, we highlight that our findings relate to the important and integral role of institutional quality on the process of development.

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[11] China and Thailand are examples of countries with initial levels of urbanisation and low unemployment and that have experienced increasing inequalities associated to high and sustained economic growth.

Hence, the experience of the 1980s, and the subsequent cycle of low long-run economic growth is a cautionary tale about the future risks for growth of high unemployment and increasing inequality in our current times. «The economic slowdown may entail a double-dip in employment... exacerbating inequalities and social discontent... and further delaying economic recovery» (ILO, 2011). Policies aiming at controlling the dramatic rise in unemployment associated to the current crisis, and in particular at reducing its inequality-associated effects, are not just pressing for the obvious current difficulties that they represent for society today, but also because of the handicap that they represent for future long-run growth. The analysis at the regional level both in developed and developing countries deserves future research, as institutional aspects would be better controlled for, and the distributional aspects related with unemployment could be better analysed.

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Annex 1.   Variables used

Variable	Description	Source
GROWTH	Accumulated annual average per capita GDP growth rate. (1990-2007).	Constructed with data from Summers and Heston, using real GDP chain data (rgdpch).
LOG_PCGDP	Per capita GDP (in log). 1990.	Constructed with data from Summers and Heston, using real GDP chain data (rgdpch).
LIFE_EXP	Life expectancy at birth in 1990.	World Bank.
SCHOOLING	Mean years of schooling, age 25+, total.	World Bank.
PI	Price of investment in 1990.	Summers and Heston.
INEQUALITY	Gini coefficient.	Gruen and Klasen 2008*.
UE_MEAN	Unemployment rate. Average annual rate between 1980 and 1990.	World Bank.
UE_MAX	Unemployment rate. Maximum annual rate between 1980 and 1990.	World Bank.
URBAN	Urban population as percentage of total population. 1990.	World Bank.

* For the following countries missing values for 1980 were filled with the closest available value: Austria, Bahamas, Chile, Guatemala, Jordan, Mauritania, Nicaragua, Paraguay and Venezuela.

Annex 2.   List of countries

Country	Country	Country
Australia	Finland	Netherlands
Austria*	France	Nicaragua*
Bahamas*	Greece	Norway
Bangladesh	Guatemala*	Pakistan
Belgium	Honduras	Panama
Bolivia	Indonesia	Paraguay*
Brazil	Ireland	Peru
Canada	Israel	Philippines
Chile*	Italy	Portugal
China	Jamaica	Spain
Colombia	Jordan*	Sweden
Costa Rica	Korea, Republic of	Thailand
Denmark	Luxembourg	Turkey
Ecuador	Malaysia	United Kingdom
Egypt	Mauritania*	United States
El Salvador	Morocco	Venezuela*

* Only included in the 48-countries sample because of lack of data to calculate change in INEQUALITY.

Comment on «Unemployment and Long-run Economic Growth: The Role of Income Inequality and Urbanisation», by David Castells-Quintana and Vicente Royuela

Roberto Ezcurra *

This article by David Castells-Quintana and Vicente Royuela investigates the effects of unemployment and income inequality on economic growth in 48 countries with different levels of economic development over the period from 1990 to 2007. The article is well motivated and written. The research questions are articulated clearly, and the discussion of the literature shows that the authors are familiar with the subject under consideration. In my opinion, the main contribution of the article is the attention paid by Castells-Quintana and Royuela to the role of the interaction between unemployment and income inequality in explaining variations in economic growth rates across the sample countries. This issue is nowadays of particular relevance because the current economic crisis is characterised by a considerable destruction of employment and a probable increase in the level of income inequality.

From a methodological perspective, Castells-Quintana and Royuela estimate different «Barro-type» cross-section growth regressions using ordinary least squares (OLS). Their results reveal that income inequality is harmful for economic growth, particularly in those countries with relatively low levels of urbanisation. In principle, this finding is in contrast to the traditional equity-growth trade-off, which postulates that income inequality produces incentives for resources to be channelled into more efficient use, thus increasing capital accumulation and savings rates (Kaldor, 1956). Nevertheless, the negative association between income inequality and economic growth observed in the present article is consistent with more recent theories that argue that greater inequality can lead to distorting redistribution policies, inefficient credit constraints, social unrest and political conflicts (Partridge, 2005). In fact, studies using OLS cross-section growth regressions generally find that income inequality is negatively correlated with economic growth (Alesina and Rodrik, 1994; Persson and Tabellini, 1994), a similar result to that obtained by Castells-Quintana and Royuela. However, other studies based on panel data techniques tend to reveal a positive link between income inequality and economic growth (Li and Zou, 1998; Forbes, 2000). Thus, it would be interesting to find out whether the results of the present article still hold when panel data techniques are employed. Although it is likely that this is not an easy task in this context due to the lack of data on income inequality, panel estimation would make it possible to control for time-invariant country-specific effects, thereby eliminating a potential source of omitted-variable bias. Castells-Quintana and Royuela also find that, although unemployment initially does not exert a significant effect, its interaction with the variation in income inequality during the study

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period is negatively associated with economic growth. This seems to suggest that the combination of high unemployment rates with increases in the degree of income distribution dispersion are related to significantly lower growth rates throughout the ensuing years. It is important to note that this finding is particularly relevant in the context of the current economic crisis because there are numerous countries across the world with high unemployment rates and increasing levels of income inequality. Nevertheless, this result should be interpreted with some caution because the relevant coefficient estimates are only statistically significant at the 10% level.

It is not difficult to conceive additional extensions work of Castells-Quintana and Royuela. One relates directly to the enlargement of the number of countries included in the sample. It is likely that the lack of adequate income inequality data has prevented the authors from pursuing this issue, but addressing it may provide a more complete picture about the nature of the complex links between unemployment, inequality and economic growth. Furthermore, as is common in the literature, the authors exclusively use the Gini index to measure the degree of income distribution dispersion in the sample countries. Nevertheless, the results of the article may be sensitive to the choice of the measure used to quantify the relevance of income inequality. In this respect, various inequality measures may actually yield different orderings of the distributions one wishes to compare because each index has a different way of aggregating the information contained in the distribution under study (Cowell, 1995). Future research will also have to pay special attention to the need to identify and study the various theoretical mechanisms that explain the potential impact of unemployment and income inequality on economic performance.

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