The Personal and the Factor Distributions of Income in a Cross-Section of Countries

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Abstract: The shares of capital and labour in national income vary substantially both over time and across countries. This paper shows that the factor distribution of income is an essential determinant of the personal distribution of income. We use cross-country and panel data for a group of developed and developing countries to show that a larger labour share is associated with a lower Gini coefficient of personal incomes. This effect is not only statistically significant but also economically important. An increase in the labour share in Mexico to that observed in the US would reduce the Gini coefficient of the former by between 2 and 5 points.

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1. Introduction

Income inequality has been a major concern for economists over the past two hundred years. Yet, anybody familiar with this literature would notice a major shift in interest from the factor to the personal distribution of income that took place in the 1970s. After a century and a half of debates on how capital and labour are rewarded, economist started to address the issue of what determines the distribution of income across individuals in a society, with the seminal work of Atkinson (1970, 1975), Champernowne (1973), Sen (1973), Stiglitz (1969), and Tinbergen (1975). This change in perspective was largely due to a combination of two factors: on the one hand, the increase in capital ownership across the population, that implied that the distinction between workers and rentiers was less clear-cut; on the other, the availability of data on personal incomes. The aim of this paper is to show that both questions are related, as the factor distribution of income remains a major determinant of the personal distribution.

The market incomes of individuals come from two main sources, capital and labour.[1] If the distributions across agents of those two factors differ, then the share of national income that is used to reward each of the two factors will be a determinant of the distribution of personal incomes. However, despite a surge of interest in the determinants of the personal distribution of income across countries in recent years, the role of factor shares has not been examined. This lack of interest in the relationship between the factor distribution of income and personal income inequality is most likely due to the well-established belief among economists that the shares of capital and labour are constant over time and across countries. Yet, as was argued by Solow (1958) and has been shown by recent work, this is far from being the case (see Blanchard,1997; de Serres et al., 2002;

Daudey, 2005). Then, if the labour share varies across countries and over time, it is a candidate explanation for differences in the personal distribution of income.

In this paper we examine what determines differences in the distribution of personal incomes, as measured by the Gini coefficient, across countries. Data on both the labour share and the Gini coefficient are scarce. We construct a panel of 39 countries over the period 1970-1994, and regress the Gini coefficient on a number of standard variables, such as the level of income and educational attainment. We find that adding the labour share as a regressor improves the fit of the equation substantially, and that the labour share has a negative and significant impact on the Gini coefficient.

Our work adds to the recent revival of interest in the factors shaping the distribution of income across countries. For several decades, empirical work on cross-country differences in the distribution of income consisted of tests of the Kuznets hypothesis taking the form of regressions of inequality on the level of GDP and its square. Recently, a number of authors have proposed a modified Kuznets hypothesis or suggested alternative hypotheses. Examples of the former approach are Bourguignon and Morrisson (1998), who argue that the degree of dualism in labour markets affects the relationship between output and distribution; Milanovic (1994) who controls for the size of the public sector and of social transfers; and Higgins and Williamson (1999) who condition on the country's position on the demographic transition, and emphasize the role of cohort size on distribution. Alternative hypotheses, such as the role of education, financial development, democratisation, or macroeconomic volatility have been proposed; see Li, Squire and Zou (1998), Barro (2000), Breen and García-Peñalosa (2005).

A number of recent papers have been concerned with the labour share. The focus of these works has been to understand the determinants of either the evolution of the labour share over time or cross-country differences; see Blanchard (1997), Rodrik (1999), Harrison (2002), Bentolila and Saint-Paul (2003). We present a different perspective, trying to understand not the determinants but the effects of differences in the rewards to capital and labour across countries and over time.

The paper is organised as follows. Section 2 discusses the theories that have been put forward concerning the determinants of income inequality. Section 3 describes the data, and our results are presented in section 4. Section 5 concludes.

2. Theoretical considerations

2.1. The basic determinants of the distribution of personal incomes

By definition the income of an individual depends on two things: her factor endowments and the returns to those endowments. Consider an economy with two production factors, capital, *K*, and labour, *L*, where aggregate output is given by $Y = F(K, L)$. Assuming all agents supply one unit of labour, we can write the market income of agent *i* as

$$Y_i = w_i + rK_i \tag{1}$$

where w_i denotes her wage, K_i her stock of capital and *r* the interest rate.[2] Because we are concerned with the distribution of income, we define y_i as the income of individual *i* relative to the average income in this economy, $y_i \equiv Y_i / (Y / L)$. We can then express the relative income as:

$$y_i = LS \cdot \omega_i + (1 - LS) \cdot k_i, \tag{2}$$

where $\omega_i \equiv w_i / \overline{w}$ is the individual's wage relative to the average wage, $k_i \equiv K_i /(K / L)$ is her relative endowment of capital, and *LS* is the share of labour in aggregate output defined as:

$$LS \equiv \frac{\overline{w}L}{Y} \tag{3}$$

The distribution of personal income then depends on three factors: the distribution of labour endowments, the distribution of capital endowments, and the way in which aggregate output is shared between the two production factors. Clearly, if the distribution of capital is more unequal than that of labour, an increase in the labour share would reduce personal income inequality (from now onwards, whenever the term *inequality* is used without further comments we will be refereeing to inequality in the distribution of personal incomes).

If we had data on these three variables, we could decompose the variances of incomes and assess the contribution of each of these variables to inequality. However, data on the distribution of wealth or of labour endowments are rare, and our empirical analysis needs to find proxies for those. In fact, most of the variables traditionally used to explain inequality can be seen as such proxies. In the next section we examine the main hypotheses that have been empirically tested in order to explain cross-country differences in inequality. We will show that all of them work through one of the three variables in equation (2). Our simple formulation thus allows us to encompass the various determinants of the personal distribution of income proposed in the literature.

2.2. Existing hypotheses about the determinants of inequality

2.2.1. The level of income

The Kuznets hypothesis postulates that inequality is driven by the allocation of labour between the modern and the traditional sector, which in turn can be proxied by a country's level of output. Kuznets suggested that in the early stages of development, technological change and industrialisation would raise the demand for skills and capital, thus increasing inequality. Eventually these forces would lead to the disappearance of the traditional and/or informal sectors, and inequality would fall. The so-called "strong version" of the Kuznets hypothesis hence implies an inverted-U shaped relationship between income and inequality.[3]

Recent work has tended to reject the strong version of the Kuznets hypothesis, as shown by Anand and Kanbour (1993). A "weak version" or modified Kuznets curve has hence been postulated: the forces described above can be offset or reinforced by other aspects, and a number of authors have suggested possible mechanisms. These include the average age of the population, the degree of mobility of workers across sectors or regions, or the size of social transfers, all of which tend to increase with per capita incomes.[4]

The Kuznets hypothesis can be reformulated in terms of the effect of development on the labour share. Equation (3) implies that the transfer of population from the traditional to the modern sector, where wages and per capita output are higher, would affect the sharing of value-added through its impact on both the average wage and the output level. The effect is however ambiguous: on the one hand, with higher wages in the modern sector, the wage bill will tend to rise as the economy develops; on the other,

output will also increase. It is likely that in the early stages of development, when the marginal product of labour in the modern sector is high, the wage effect dominates, while in latter stages diminishing return to labour would be strong and the output effect would dominate. Both Diwan (2000) and Harrison (2002) find an inverted-U relationship between the labour share and the level of GDP per capita, indicating that the effect of rising wages is strongest for low levels of development.

2.2.2. Human capital

The average level of education is often taken to be a major determinant of inequality. A greater supply of skilled labour tends to reduce the skill premium and hence reduces inequality in the distribution of labour incomes, as argued by Li, Squire and Zou (1998). There is a second reason why the average level of education may affect inequality. For a given return to education, a more equal distribution of years of schooling would result in less inequality. Education expansion is unlikely to increase proportionally the education of all agents, and hence could in principle make the distribution of years of education more or less unequal. The empirical evidence indicates that countries with a higher average educational attainment have a lower Gini index of years of education (Thomas, Fan, and Wang, 2000; Checchi, 2004; Checchi and García-Peñalosa, 2004), and this would be a second reason why we would expect the level of education to have a negative impact on inequality. However, Thomas, Fan, and Wang (2000) find that, for low levels of education, a higher average value is associated with greater dispersion if we measure it by the standard deviation, and this could partially offset the effect of a reduced relative wage on income inequality.

Higher educational attainment is also likely to affect the labour share through its effect on both the skilled and unskilled wages, as well as through the number of both types of workers. In particular, with two types of workers, educated denoted by *S,* and uneducated, denoted by *U*, and letting w_S and w_U be their respective wages, we can write

$$LS \equiv \frac{w_S S + w_U U}{Y} \tag{4}$$

An increase in *S* will raise both Y and w_U, and reduce *U* and w_S, with the overall effect depending on the elasticity of the demand for labour. If the effect on wages is not too strong, a more educated labour force will result in a higher labour share. Diwan (2000) provides empirical evidence for this hypothesis, showing that the average level of education has a positive impact on the labour share, at least among rich countries.

2.2.3. Openness

The degree of openness is often argued to be a major determinant of income inequality (Wood 1995, 1997). According to Hecksher-Ohlin theory, trade changes factor prices, increasing the remuneration of the abundant factor in each country. This effect will tend to reduce inequality in poor countries, which experience an increase in unskilled wages, and increase it in rich countries where greater openness leads to higher returns to skills and to physical capital. The sign of the impact of openness on inequality will hence depend on a country's factor endowment. The empirical evidence is mixed, with a number of authors reporting no effect of openness on inequality (Li et al. 1998; Higgins and Williamson, 1999; Dollar and Kray, 2002) and others finding a positive effect, which

is stronger for poorer countries (Barro, 2000; Ravallion, 2001; Lundberg and Squire, 2003; Milanovic, 2005).

The changes in factor rewards described above will affect the factor distribution of income. The literature has highlighted two additional mechanisms through which openness affects the labour share, both of which operate through the wage bargaining process. First, openness allows managers to use the threat of delocalising the production plant to weaken labour's bargaining position, leading to a reduction in the labour share. Second, as the economy becomes more open, the price of tradable goods falls, reducing the firm's surplus and hence the amount that workers can obtain through bargaining. Once again, this will result in a reduction in the labour share. Two recent papers have indeed found a negative correlation between the degree of openness (measured as trade shares, occurrence of exchange rate crisis, and extent of capital controls) and the labour share; see Harrison (2002) and Ortega and Rodriguez (2002).

2.2.4. Civil liberties

The recent literature on distribution has emphasized the role of civil liberties, which has been found to be negatively correlated with income inequality; see Li et al. (1998) and Lundberg and Squire (2003). The inclusion of a variable measuring the extent of democratisation or civil liberties is based on the idea that limited civil liberties allow the top income group (a minority) to affect public policies in a way that increases their income share. The exact way in which this takes place is, however, not usually specified. Minorities could increase their incomes because they seize assets and thus increase their endowments, or because they affect the way in which factors are rewarded. This second

mechanism has been emphasized by Rodrik (1999), who finds that democratic countries tend to pay higher wages and have a larger labour share. The increase in the labour share brought about by democratisation implies that the impact of democracy on inequality could be mediated by this variable.

3. The data

3.1. Measures of the labour share

The labour share is calculated from national accounts data as the ratio of employee wages and salaries to value added[5]

$$LS = \frac{\text{wages and salaries}}{\text{GDP}} \qquad (4)$$

Date on the labour share have two problems. The first one concerns the comparability across countries of the data. In this paper we use data on the labour share in the manufacturing sector from the United Nations Industrial Development Organization (UNIDO) data base. Because of the way in which the data has been collected, international comparability is greater than for other sources. Obviously, the impact of this variable on the distribution of personal incomes in the economy as a whole will depend on the importance of the manufacturing sector in the economy. For this reason, we will control for the size of the manufacturing sector in our empirical specifications.

The use of data on manufacturing only implies that the measure of the labour share we have does not correspond exactly to what we would like to measure –how income is allocated between the two factors of production. Hence, in our regressions

equations we will take into account the potential divergence between the aggregate labour share and that in the manufacturing sector by controlling for the size of the latter.

The second problem is that the above naive measure of the labour share incorporates only payments to corporate workers, implicitly classifying all income of self-employed workers as capital income, and hence underestimating the labour share. A number of adjustments have been proposed[6]. The first consists of adding all income of the self-employed to the numerator in (4), which implies all their income is treated as labour income. The second attributes a wage to the self-employed – either equal to the average wage of employees, or to half the average wage of employees– and adds the number of self-employed times the attributed wage to the numerator. However, the data for the number of self-employed and their income are available only for a limited number of countries. Moreover, the assumptions made about the wages of the self-employed are ad hoc. Why the same wage as employees? Why half and not a third? Why should the ratio of wages of employees and self-employed be the same in Mexico as in the US? Furthermore, for some developing countries using these adjustments results in labour shares well over 100 per cent! (see Bernanke and Gürkaynak, 2001). Because of the lack of consensus and the unrealistic values obtained when adjusting the data, we employ undajusted labour shares.

Figure 1 around here

The UNIDO data provides a panel of 113 countries over the period 1970-94 (see appendix for more details). A simple look at the data indicates a huge variability across countries. Figure 1 plots the country averages of our measure of the labour share against

GDP per capita.[7] The average labour share ranges from 15 per cent for Nicaragua and Thailand, to 61 per cent for New Zealand. Industrial countries show less variation, with averaged country values between 40 and 60 per cent; while poorer countries have more scattered and generally smaller values (often under 30 per cent). The variation over time is more modest. For example, in France, the labour share fluctuated between 43 and 50 per cent over the period.

3.2. Other data

Our analysis of cross-country differences in inequality is limited by the availability of data on the distribution of income. We draw on the World Institute for Developments in Economic Research dataset (WIDER, version WIID2 Beta), and use measures of the Gini coefficient of personal income and, when available, quintile shares. Most of the WIDER data corresponds to the Deininger and Squire dataset (Deninger and Squire, 1996), so we constructed our sample by using only the WIDER observations that Deininger and Squire consider "high quality". The income definitions used some times differ. For example, the Gini coefficient can be calculated on gross or net incomes (see appendix). We therefore constructed a subsample in which we retained, for each country, only observations that had the same definition over time. This second panel is substantially smaller, and we will use it in the sensitivity analysis.

Other data come from well-known cross-country data compilations, in particular the Penn World Table (6.1), Barro and Lee (2000) and Freedom House (2003). All data are annual, though not available for all years for all countries. Unless otherwise specified, the data have been averaged over 5-year periods. Our final sample contains 117

observations for 39 countries between 1970 and 1994. Table 1 presents some descriptive statistics.

Table 1 around here

4. The determinants of inequality across countries

4.1. Cross-sectional results

Table 2 reports the results obtained when we regress the Gini coefficient in 1990 –the most recent data for which we have a substantial number of observations- on the labour share for our cross-section of countries. Column *a* reports a baseline regression, where the Kuznets effect seems to be the dominating force driving differences in inequality across countries. The next column introduces the labour share (LS) and manufacturing share (MANUF), both measured over the previous 5 years, as explanatory variables. As expected, both a higher labour share and a larger manufacturing sector tend to reduce the Gini coefficient. The introduction of these variables increases by one third the explanatory power of the equation.

Table 2 around here

Columns *c* and *d* report alternative specifications in which we interact LS with the manufacturing share. The effect of LS remains negative, and is stronger the larger the manufacturing sector is. Note that when an interacted term is used, the size of the manufacturing sector has no direct impact on inequality. The last two columns use as an

explanatory variable the labour share measured over the period 1970-89. The results indicate that the long-run labour share has a strong negative and significant impact on income inequality. The possible explanation for this effect is that the long-run labour share acts as a proxy for one of the distributional variables that we are missing. In particular, the rewards to labour in the past can determine the extent to which workers are able to accumulate human and physical capital and hence act as a proxy for the distribution of those two assets.

We included the square of LS as well as its level in several specifications, but found that it had an insignificant coefficient and no impact on other coefficients. Note also that the coefficients on logGDP and its square remain largely unchanged by the introduction of the labour share and the size of the manufacturing sector, indicating that the Kuznets effect does not operate through the labour share.

4.2. Pooled estimations

Table 3 exploits the panel dimension of our dataset. We pool the available data using five-year observations for as many countries as possible. The panel is unbalanced, with the largest number of observations for the period 1985-89. The labour share proves to have a negative and significant impact on income inequality in all our specifications. Column *b, c* and *d* report alternative specifications. As in the cross-country regressions, the impact of the labour share is greatest the larger the manufacturing sector is, while manufacturing per se has no effect on the distribution of income. As in table 2, the coefficients on GDP remain significant. Other explanatory variables perform badly. In

particular, the impact of variables such as human capital and democracy (civil liberties) do not seem to be robust to the inclusion of LS.

Table 3 around here

Our preferred specification is reported in column *c*. The impact of the labour share on Gini is economically large. Consider Mexico, a country with a value of LS of 21%. Increasing its labour share to the value for the U.S., i.e. to 42%, would decrease the Gini coefficient in Mexico by 2.05 points (that is, 24 % of the standard deviation of Gini in our sample). In column *d* the share of manufacturing is also included, and the resulting coefficient on the (interacted) labour share is substantially higher. In this case, an increase in the labour share in Mexico to that in the US would raise the Gini coefficient by 7 Gini points.

The last two columns of table 3 report the regression equations without period dummies. As can be seen comparing columns *c* and *d* with *e* and *f*, these dummies make basically no difference to the estimations. In fact, in most specifications the dummies are not significant.

In order to better understand the way in which differences in the labour share affect the distribution of income, we use as a dependant variable the quintiles of revenue. The results are reported in table 4. The coefficients on LS are positive for the first, second, and third quintiles and negative for the top one. This seems to indicate that a greater labour share redistributes income from the top income group towards poorer individuals. An increase of the labour share of one standard deviation –evaluated at the sample mean for Manuf- results in a reduction of the share of the top quintile of 4 percentage points.

Table 4 around here

4.3. Robustness checks

In order to check the robustness of our results we perform a number of additional estimations. First, there are potential endogeneity problems. For example, the distribution of income can itself affect the extent of democratisation in a country, which in turn determines the labour share. In order to control for this possible endogeneity problem we perform instrumental variable estimations (2SLS estimations). We use as instruments lagged values of the explanatory variables. Column *b* uses two lags for LS (equivalent results were obtained with one lag only), while column *c* also allows for the potential endogeneity of the level of human capital and the degree of civil liberties, using two-period lags of both variables as instruments. The coefficient on LS is still significant, and slightly larger.

Second, as Atkinson and Brandolini (2001) discuss, cross-country comparisons of income inequality are problematic. Often different definitions are used that make these comparisons difficult. They suggest using different data sets in order to check the robustness of the results. Column *c* uses the reduced WIDER dataset, in which all observations for a country are based on the same income definition. We also employ alternative data for the labour share, which covers the whole economy rather than only manufacturing (see appendix for the details). The estimates are reported in column *d*, where the interaction with the size of the manufacturing sector has been removed. The results from these two columns confirm the negative impact of the labour share on personal income inequality.

Table 5 around here

Third, social and institutional determinants of inequality that are not directly measured could be a source of unobserved heterogeneity in our estimations. In order to control for it we perform fixed-effect and random-effect estimators. Columns *e* to *h* present two alternative specifications of the random-effects (RE) and the fixed-effects (FE) models. In the RE models the labour share has a negative and significant effect on inequality, although its strength does not seem to be mediated by the size of the manufacturing sector. In the FE models, the coefficient on LS is significant when the size of the manufacturing sector is included, but not when it is omitted. It is therefore unclear whether the impact of the labour share is a pure cross-country phenomenon, or whether, within a particular country, reductions in the labour share can bring about a more equal distribution of income. Note that despite the presence of a country fixed-effect, column *f* implies a substantial impact of a change in the labour share: increasing the labour share in Mexico to that of the US would reduce the Gini coefficient by 5.2 points. Using the RE estimator, the impact of such a change in LS would be to reduce inequality by 4 Gini points.

A further concern is the presence of collinearity in the data. As we have seen in section 2, there are a number of variables that have both a direct effect on the personal distribution of income and an indirect one through factor shares. Examples of this are the degree of openness or of democratisation, and the level of income. In fact, it seems that interactions between our explicative variables do not affect a lot our results for two reasons. First, we do not detect clear differences in each regressor's performance before and after the introduction of the labour share. Second, it is possible to show that allowing

for possible collinearity between variables would only have resulted in improvement of the explicative power of civil liberties and education without altering the coefficient of the labour share[8].

5. Conclusions

This paper adds to the recent revival of interest in the factors shaping the distribution of income across countries. For decades empirical work on cross-country differences in personal income inequality consisted of tests of the Kuznets hypothesis taking the form of regressions of inequality on the level of GDP and its square. Only recently have variables other than the level of income been considered, such as cohort sizes, trade openness, the level of human capital, the degree of democratisation, or the distribution of land. One aspect that has received little attention is the role of the distribution of income between capital and labour. If wealth is more unequally distributed than labour endowments, a greater share of capital will tend to increase inequality in personal incomes. In this paper, we have examined on the role of factor shares in determining the personal income distribution.

We regress the Gini coefficient of personal income on the labour share and the level of income for a sample of developed and developing countries. Our cross-country and panel evidence shows that a larger labour share is associated with lower inequality. This relationship is robust to controls for the factors that previous research has shown to be major determinants of income inequality.

Our analysis indicates a new potential tradeoff between growth and equality. In order to attract foreign investment and promote growth, developing countries have tended to foster policies that are favorable to capital and increase its return. Our results imply

that policies that raise the share of capital have a substantial cost in terms of inequality. This means, not only that governments should carefully assess the desirability of such policies, but also that external shocks that tend to reduce the labour share may call for corrective policies in order to offset their distributional implications.

Appendix: Data Description

Income Inequality

We use two measures of inequality: GINI, which denotes the Gini coefficient of income, and Qy, which denotes the income share of the y^{th} quintile, with y=1..5.

Source: Our main database is obtained from the compilation provided by the World Institute for Developments in Economic Research (WIDER). We used the revised version of the World Income Inequality Database (WIID2 Beta), released on 3 December 2004 (http://www.wider.unu.edu/wiid/wiid.htm). The WIID2 beta data is, to a large extent an updated version of the widely-used dataset of Deininger and Squire (1996), completed with data from other sources such as the Luxembourg Income Study and Transmonee.

WIDER provides annual data on Gini coefficients and, in some cases, quintile shares. We selected all observations obtained at the national level and which cover the whole population. The Gini coefficients can be based on income or expenditure data, income may be gross or net, and they can be calculated for households or for persons. We tried to have as many observations as possible for persons, on gross income. When not available, other measures where used. The resulting dataset is almost identical to the Deininger and Squire high-quality subset. From the annual data we calculated five-year averages. When merged with other data, this gives us 117 five-yearly observations for 39 countries over the period 1960 to 1994.

We constructed a subsample in which, for each country, the income definition did not vary over time. The resulting sample, once we averaged over 5-year periods, contains 75 observations.

The labour share and the share of manufacturing

LS: Our measure of the labour share is defined as the ratio of "wages and salaries" per manufacturing employee divided by the GDP per worker in manufacturing.

Manuf: Share of manufacturing output in GDP.

Source: The data are from the United Nations Industrial Development Organization (UNIDO), http://www.unido.org/doc/3533 . Dani Rodrik kindly made the data available; all details concerning the source are reported in Rodrik (1999).

In column *d* of Table 5, LS is measured for the whole economy. It is defined as "employee compensation" divided by the "GDP per worker".
Source: United Nations Statistics, System of National Accounts. Series F, No. 2, Rev. 4 (United Nations publication Sales No. E.94. XVII.4) ; version of 25 March 2005, http://unstats.un.org/unsd/default.htm.

Other variables

Ln GDP : Logarithm of real GDP per capita, at constant 1996 US dollars, deflated by the Laspeyres price index. Variable name in original data base: rgdpl.
Openness: Share of total trade (imports plus exports) in GDP, measured in constant 1996 prices. Variable name in original data base: openk.
Source: Alan Heston, Robert Summers and Bettina Aten, Penn World Table Version 6.1, Center for International Comparisons at the University of Pennsylvania (CICUP), 2002; version of 25 March 2005; http://pwt.econ.upenn.edu/php_site/pwt_index.php

Civil Liberties: Civil Liberties index consisting of a subjective classification of countries on a scale of 1 to 7, with higher ratings indicating less freedom. The categories considered include: the existence of free elections, democratic electoral systems, and the representation of religious and ethnic minorities.
Source : Freedom House Index (civlib), *Annual Survey of Freedom Country Scores* from 1972 to 2003. Version of 25 March 2005.
http://www.freedomhouse.org/ratings/allscore04.xls.

Human Capital: Average schooling years in the total population over age 25, in five years averages.
Source: Robert Barro and Jong-Wha Lee (2000); version of 25 March 2005. http://www.cid.harvard.edu/ciddata/ciddata.html.

Table A1 around here

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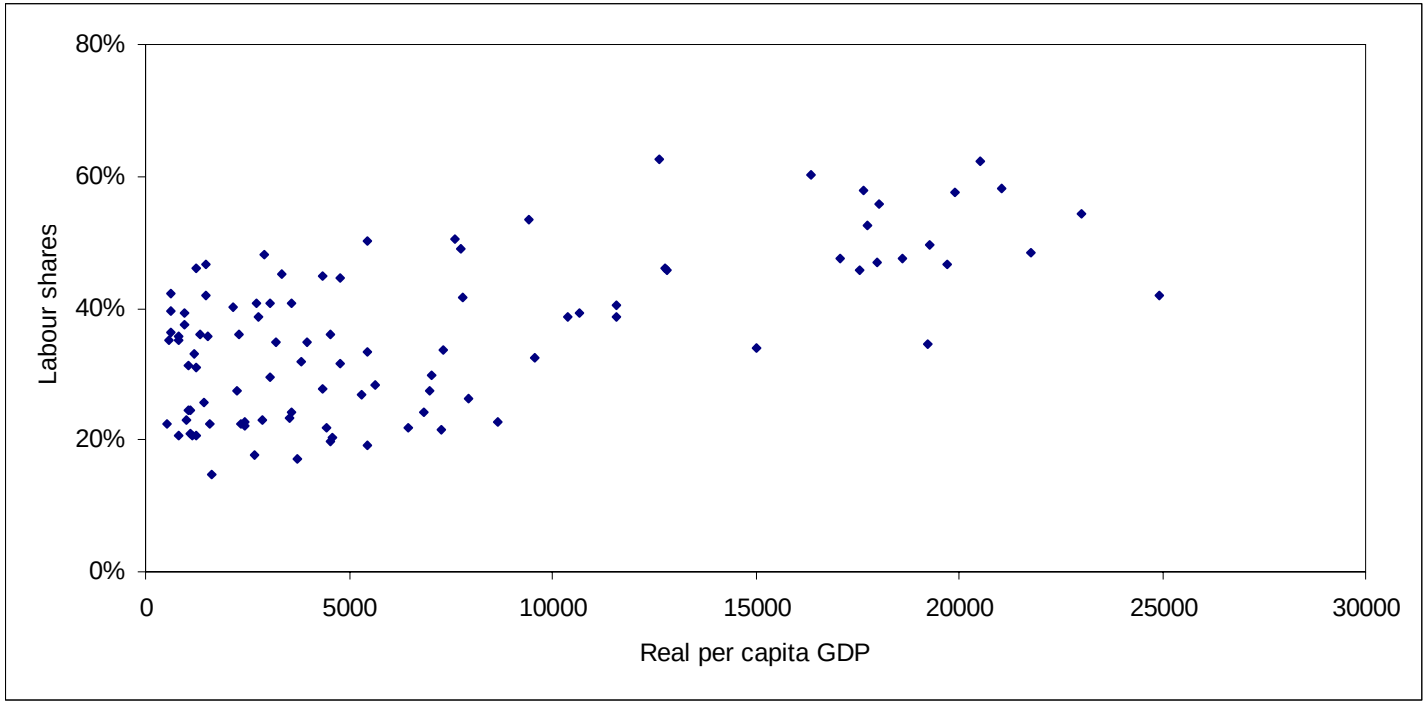
Figure 1 : Per capita income and the labour share



Sources: Labour share in manufacturing from UNIDO, real per capita GDP in constant prices from PWT(6.1).

Table 1: Descriptive statistics

Variables	N	Mean	Std. Deviation	Correlation with LS	Min.	Max.	Std. Deviation (country average)
Gini (high quality)	117	41.80	8.57	-0.39	23.75	60.18	8.91
Gini (reduced sample)	75	41.84	9.15	-0.40	22	61	9.14
Labour Share	117	35.14	13.85	1.00	14.07	74.71	13.12
Manufacturing Share	117	19.28	6.54	-0.08	5.36	35.99	
Log GDP per capita	117	8.51	.90	0.45	6.44	10.12	
Openness	117	55.72	43.63	0.07	9.59	259.32	
Civil Liberties	117	3.37	1.66	-0.33	1	7	
Human Capital	117	4.89	2.66	0.43	.84	12.14	

Table 2 : Gini coefficient: cross-country regressions

	a	b	c	d	e	f
Estimation Method	OLS	OLS	OLS	OLS	OLS	OLS
Period 1985-89						
LS		-24.144*	4.061	23.764		
		[13.046]	[15.741]	[42.717]		
LS*Manuf			-1.540**	-2.559*		
			[0.715]	[2.174]		
Period 1970-89						
LS					10.217	52.11
					[17.044]	[33.791]
LS*Manuf					-1.326*	-3.306**
					[1.002]	[1.574]
Manuf		-0.465*		0.377		0.836
		[0.254]		[0.759]	[0.757]	[0.585]
Ln GDP	88.919***	92.086***	86.120***	79.735**	23.834***	30.032*
	[31.540]	[32.798]	[31.356]	[34.243]	[18.648]	[30.613]
Square (Ln GDP)	-5.338***	-5.348***	-4.996**	-4.636**	-1.511**	-1.956
	[1.867]	[1.938]	[1.862]	[2.019]	[1.002]	[1.953]
Civil Liberties	-6.441	-4,3	-3.205	-2.208	-1.439	-1.235
	[7.686]	[7.520]	[7.325]	[7.682]	[7.286]	[7.206]
Human Capital	-0.203	-0.253	-0.173	-0.129	-1.239	-1.211
	[0.856]	[0.821]	[0.808]	[0.823]	[0.904]	[0.894]
Openness	0.013	0.006	0.005	0.007	0.016	0.021
	[0.032]	[0.031]	[0.031]	[0.031]	[0.031]	[0.031]
Definition Dummies	Yes	Yes	Yes	Yes	Yes	Yes
N. observations	39	39	39	39	33	33
Adjusted R^2	0.31	0.41	0.43	0.43	0.52	0.54
Standard Error	7.13	8.12	7.97	8.07	8.82	8.72

Note: Standard errors in brackets; * significant at 10%; ** significant at 5%; *** significant at 1%. Dependent variable is Gini coefficient in 1990. In columns a to e, all variables have been taken for the period 1985-89; in columns f and g, all variables have been averaged over the period 1970-1989.

Table 3 : Gini coefficient: panel data

	a	b	c	d	e	f
Estimation Method	OLS	OLS	OLS	OLS	OLS	OLS
LS		-10.220*	2.909	17.55	1.379	16.439
		[6.097]	[6.087]	[15.986]	[5.912]	[15.762]
LS*Manuf			-0.466**	-1.584**	-0.468*	-1.498*
			[0.273]	[0.844]	[0.265]	[0.834]
Manuf		-0.136		0.389		0.37
		[0.120]		[0.304]		[0.301]
Ln GDP	40.592***	36.619**	39.907***	37.792**	40.268***	39.634***
	[12.467]	[15.497]	[12.923]	[15.317]	[12.727]	[15.094]
Square (Ln GDP)	-2.501***	-2.085**	-2.404***	-2.167**	-2.427***	-2.285**
	[0.773]	[0.960]	[0.802]	[0.949]	[0.789]	[0.935]
Civil Liberties	4,855	7.320*	4,434	7.379**	3.818	7.274**
	[2.964]	[3.693]	[3.169]	[3.647]	[3.085]	[3.560]
Human Capital	-0.512	0.028	-0.501	0.016	-0.466	-0.09
	[0.342]	[0.402]	[0.342]	[0.397]	[0.323]	[0.376]
Openness	0.007	-0.003	0.005	0	0.006	0.001
	[0.013]	[0.016]	[0.013]	[0.016]	[0.013]	[0.015]
Definition Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Regional Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Period Dummies	Yes	Yes	Yes	Yes	No	No
N. observations	117	117	117	117	117	117
N. countries	39	39	39	39	39	39
Adjusted R^2	0.61	0.59	0.71	0.6	0.71	0.59
Standard Error	5.03	5.97	4.99	5.89	4.96	5.85

Note: Standard errors in brackets; * significant at 10%; ** significant at 5%; *** significant at 1%..

Table 4 : Quintiles of revenue : panel data

	Q1	Q2	Q3	Q4	Q5
Estimation Method	OLS	OLS	OLS	OLS	OLS
LS	-6.211*	-6.007	-5.247	2.378	15.088
	[3.699]	[4.691]	[3.755]	[3.178]	[13.242]
LS*Manuf	0.469**	0.539**	0.577***	-0.036	-1.621**
	[0.199]	[0.253]	[0.202]	[0.171]	[0.714]
Manuf	-0.083	-0.113	-0.158**	-0.031	0.386
	[0.071]	[0.090]	[0.072]	[0.061]	[0.254]
Ln GDP	-14.282***	-15.907***	-11.235***	-9.282***	50.705***
	[3.770]	[4.782]	[3.827]	[3.239]	[13.498]
Square (Ln GDP)	0.829***	0.922***	0.656***	0.569***	-2.976***
	[0.228]	[0.290]	[0.232]	[0.196]	[0.817]
Civil Liberties	1.921**	1.495	0.353	-0.292	-3.477
	[0.917]	[1.163]	[0.931]	[0.788]	[3.283]
Human Capital	0.01	0.131	0.204**	0.209**	-0.553
	[0.095]	[0.120]	[0.096]	[0.081]	[0.339]
Openness	-0.004	-0.005	-0.007*	0.003	0.013
	[0.004]	[0.005]	[0.004]	[0.003]	[0.014]
Definition Dummies	Yes	Yes	Yes	Yes	Yes
Regional Dummies	Yes	Yes	Yes	Yes	Yes
Period Dummies	Yes	Yes	Yes	Yes	Yes
N. observations	92	92	92	92	92
N. countries	30	30	30	30	30
Adjusted R^2	0.62	0.57	0.7	0.67	0.66
Standard Error	1.34	1.70	1.36	1.15	4.08

Note: Standard errors in brackets; * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 5 : Gini coefficient: robustness analysis

	a	b	c	d	e	f	g	h
Estimation Method	IV	IV	OLS	OLS	RE	FE	RE	FE
LS	9.327	2.403	8.205	-5.322*	-19.524*	-25.365*	-10.285*	-9.538
	[7.299]	[6.264]	[9.513]	[3.053]	[11.367]	[12.983]	[6.138]	[7.810]
LS*Manuf	-0.662*	-0.543**	-0.792**		0.385	1.127	-0.17	-0.011
	[0.387]	[0.297]	[0.396]		[0.628]	[0.813]	[0.257]	[0.317]
Manuf					-0.248	-0.491		
					[0.257]	[0.324]		
Ln GDP	49.322***	30.247**	30.685*	10.719*	37.602***	29.226	35.934**	29.486
	[14.092]	[13.881]	[16.412]	[12.198]	[14.267]	[21.622]	[14.134]	[21.858]
Square (Ln GDP)	-3.005***	-1.837**	-1.644	-0.545*	-2.164**	-1.655	-2.081**	-1.728
	[0.879]	[0.862]	[1.021]	[0.752]	[0.856]	[1.282]	[0.850]	[1.295]
Civil Liberties	1.089**	0.405	0.363	1.384	5.500*	7.979**	5.089*	7.110**
	[0.551]	[0.726]	[0.683]	[2.812]	[2.998]	[3.551]	[2.975]	[3.543]
Human Capital	-0.338	-0.296	-1.234***	-0.368	-0.69	-0.753	-0.735	-0.98
	[0.381]	[0.365]	[0.430]	[0.311]	[0.462]	[0.662]	[0.459]	[0.652]
Openness	0.011	0.011	-0.012	-0.018	0.031	0.056	0.032	0.062
	[0.013]	[0.014]	[0.019]	[0.016]	[0.022]	[0.041]	[0.022]	[0.041]
Definition Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Regional Dummies	Yes	Yes	Yes	Yes	No	No	No	No
Period Dummies	Yes	Yes	Yes	Yes	No	No	No	No
N. observations	99	94	75	135	117	117	117	117
N. countries	30	32	33	41	39	39	39	39
R^2	0.64	0.70	0.64	0.64	0.25	0.23	0.20	0.26
Standard Error	4.60	4.70	5.45	5.64				

Note: Standard errors in brackets; * significant at 10%; ** significant at 5%; *** significant at 1%;
R^2 is the overall R^2 for Random Effects, the within R^2 for Fixed Effects and the Adjusted R^2 for others.
The Hausman test statistic is $\chi^2(7) = 4.64$ for the columns (e) and (f) and $\chi^2(8) = 7.11$ for the columns (g) and (h). In both cases, we accept the hypothesis of independence of the country-specific effects necessary for random effects, at any standard level of significance. Hence, random effects are more suitable for our data.

Table A1: List of countries

List of countries
Algeria
Australia
Bangladesh
Belgium
Brazil
Chile
Colombia
Costa Rica
Dominican Republic
France
Ghana
Honduras
Hungary
India
Indonesia
Italy
Jamaica
Japan
Jordan
Korea, Republic of
Malaysia
Mexico
Netherlands
New Zealand
Norway
Pakistan
Panama
Peru
Philippines
Singapore
South Africa
Spain
Thailand
Tunisia
Turkey
Uganda
United States
Uruguay
Venezuela

[1] A third source of income are the rents on assets such as land or intellectual property rights and patents, but they represent a very minor fraction of the total.

[2] We are assuming that the return to capital is independent of the individual's wealth level. This may not be the case, as richer individuals could have access to more productive investments, increased diversification, or lower transaction costs. Taking this possibility into account would exacerbate the positive impact of wealth inequality on income inequality.

[3] See Higgins and Williamson (1999) for a discussion.

[4] See Bourguignon and Morrisson (1998), Milanovic (1994), and Higgins and Williamson (1999).

[5] Employee compensation includes wages, salaries (in cash and in kind), all other bonuses and allowances, plus employer contributions.

[6] For a more detailed discussion see Gollin (2002), Bernanke and Gürkaynak (2001), and Daudey (2005).

[7] The labour share is averaged over the entire period, GDP is averaged over 1985-90.

[8] In order to examine the impact of collinearity, consider the model:

$$GINI = \alpha LS + \beta X + \gamma W + u$$

$$LS = \delta X + v$$

Where X is a vector of variables that determine both inequality and the labour share, the vector W is constituted by inequality variables and is orthogonal to LS, and u is the error term. The labour share is explained by the same variables than Gini, captured by X, and by an exogenous, unobservable shock v. We can then rewrite GINI as:

$$GINI = (\alpha\delta + \beta)X + \alpha v + \gamma W + u$$

The real impact of LS on GINI is not measured by LS anymore, but by the coefficient on the exogenous shock (v), which is still α and hence unaffected by the presence of collinearity. Meanwhile, the coefficient on X is now ($\alpha\delta+\beta$), combining the direct and indirect impacts of these variables. Supposing that α is always negative, we have to consider two cases. If δ and β are of opposite signs, the coefficient on X, ($\alpha\delta+\beta$) has the same sign as β but is larger in absolute value. If δ and β have the same sign, the sign of ($\alpha\delta+\beta$) is ambiguous, and could be different from the sign of β. This can explain the differences in coefficients obtained for some of the variables depending on whether or not LS is included.