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# HAS GLOBALISATION INCREASED INEQUALITY?

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## **Abstract**

There has been no shortage of theories which purport to explain why globalisation may have, adverse, insignificant or even beneficial effects on income and earnings inequality. Surprisingly, the empirical realities remain an almost complete mystery. In this paper we use data on industrial wage inequality, household income inequality as well as measures of the economic, social and political dimensions of globalisation to examine this controversial issue. We find that the economic dimension of globalisation, and – less robustly – political integration, have exacerbated wage inequality in developed countries. In contrast, the impact of globalisation on both income and earnings inequality in less-developed countries has been negligible.

**Keywords:** Income and earnings inequality; globalisation; democracy; panel regressions.

**JEL classification:** F02; D30; O57; C82.

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## I. Introduction

The rapidly growing literature on the personal distribution of income and labour earnings bears testimony to the renewed interest by social commentators and economists on an important issue (Atkinson, 1997). The interest has been stimulated by the growth of income inequality in many countries during the last two decades of the last century. Another possible cause for the renewed interest may be the failure by researchers to find firm statistical evidence that changes in income inequality are driven by a deterministic Kuznets-curve process.<sup>1</sup> Consequently, the issue of which are the more important driving forces for changes in within-country income distributions is still open.

From a purely economic perspective, increases in earnings inequality could be viewed as being the result of the normal and healthy functioning of a market economy (see, e.g., Welch, 1999). However, social and political concern about the increased dispersion in the personal distribution of income, which is closely allied to increased earnings inequality, is quite pervasive. For instance, a higher incidence of low-paid jobs is usually associated with greater earnings inequality (OECD, 1996). In addition, for some countries the increases in inequality have been so dramatic so as to demand the increased attention by researchers.

Coincident with the severe deterioration in the relative, and real, return to unskilled labour in the 1980s and early 1990s, in virtually all developed countries, was the fact that these same countries experienced an increase in a number of components of something widely called ‘globalisation’. This has resulted, since the late-1980s, in an explosion of theoretical and empirical efforts to evaluate the link between globalisation and labour market outcomes, often along with evaluation of alternative explanations (most notably skill-biased

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<sup>1</sup> See Deininger and Squire (1998). Lindert (2000, p.173) argues that “[t]he Kuznets curve has to some extent tyrannized the literature on inequality trends. Energies that could have moved earlier into exploring the underlying causes of inequality were diverted into a debate over whether or not there was an inverted U curve, either in history or in postwar international cross-sections”.

technical change). Somewhat surprisingly there are a small number of econometric studies that have focussed on the core issue of whether globalisation has significantly affected income inequality in the majority of countries – both developed and developing. Moreover, the existing studies focus on various aspects of economic globalisation, i.e., flows of trade, foreign direct investment or restrictions on the capital account. However, it has been argued that globalisation also has important social and political dimensions. For example, Dreher and Gaston (2005) find that social integration contributed to deunionisation in OECD countries, while economic globalisation did not matter.

Although largely neglected in the economics literature, both political integration and social integration are likely to be important for inequality. For example, in the absence of restrictions on capital mobility, a country is more likely to competitively lower taxes or offer subsidies to attract investment the closer is a potential host country's culture to that of a source country and the easier it is to exchange information. Lower taxes may also lower social standards and this is one channel through which the social dimension of globalisation may be important for income inequality. On the other hand, political integration may ameliorate a potential 'race to the bottom' induced by economic globalisation (see Dreher 2005). Hence, while economic globalisation may increase inequality, political globalisation could actually serve to reduce it.

In this paper we use an all encompassing measure of globalisation to gauge the overall effect on both income and earnings inequality. To measure earnings inequality we employ the UTIP-UNIDO measure of industrial wage inequality; while the measure of income inequality is the Gini coefficient data recently updated and edited by Francois and Rojas-Romagosa (2005). In addition to an aggregate measure of globalisation, we also make use of

indicators of the three dimensions of globalisation – economic, political and social. Specifically, we employ the globalisation indices recently developed by Dreher (2006).<sup>2</sup>

The next section gives an overview of the research linking inequality to globalisation and states the hypotheses we examine in this paper. Section III describes our data and empirical method and section IV contains our estimates of the impact of globalisation on inequality around the world. Section V provides a discussion of the robust results, while Section VI concludes.

## **II. Globalisation and Inequality**

While most OECD economies experienced increased inequality in labour earnings during the 1980s, there were considerable differences in these developments across countries. For example, the timing of the increases was far from uniform. Among the developed countries, two experienced large increases (the United States and the United Kingdom); some experienced moderate increases in inequality (e.g., Canada and Australia); some experienced small increases (e.g., the Scandinavian countries, France and Japan); and a few experienced slight reductions or increases (notably the Netherlands and Germany). The United States and the United Kingdom continued to experience a rapid rise in earnings inequality in the 1990s.<sup>3</sup>

The level of earnings inequality experienced during the 1980s and 1990s was *not* unprecedented. For example, U.S. earnings inequality was high from the Civil War until World War I, after a period of falling inequality; it rose again until the eve of World War II. Possibly due to the existence of wage and price controls, and the growth of trade unions after the War, inequality again fell (the “Great Compression”). The increase in earnings inequality

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<sup>2</sup> The index has recently been used to analyse the impact of globalisation on various economic, political and social outcomes. For example, Ekman (2003) studies the impact of globalisation on health, Dreher (2005) studies the impact on the size of government, Tsai (2005) examines human well-being, Dreher and Gaston (2005) examine the impact on trade union membership and Bjørnskov (2006) studies the effects on institutional quality.

<sup>3</sup> See Katz and Autor (1999), tables 9 and 10.

during the 1980s returned earnings inequality to its 1939 level (see Goldin and Margo, 1992). In fact, the phenomenon of steady falls in post-WWII inequality followed by rises in inequality some time in the 1970s appears to be so widespread as to now be referred to as the “great U-turn” (Atkinson, 1997). Furthermore, changes in inequality have been episodic rather than steadily trending, and apparently not “glacial” as had been previously thought (see Atkinson, 1997, 2000; Francois and Rojas-Romagosa, 2005).

While the recent increases in inequality are statistically incontrovertible, controversy still exists over which factors have been the most important causes of the recent upward trend. For most economists, skill-biased technological progress and globalisation are widely regarded as the most likely culprits. The controversy has been more prominent in the developed economies. Bhagwati (1999) notes the ironic ‘about face’ in policy-making circles concerning the impact of globalisation on labour markets in the last twenty or so years of the last century. Post-WW2 concerns about neo-colonialism and the dependency of developing countries on developed countries, raised questions for the poorer countries about the desirability of increased integration and trade. This view has been almost completely supplanted by developing country enthusiasm for trade and inwards foreign investment. The reservations are now expressed by many wealthy countries, which worry about the perils for their domestic workers if integration via trade, migration or investment in developing countries continues apace.

At the outset, it should be noted that increased earnings dispersion in the developed economies does not appear to have been the result of shifts in employment from manufacturing to services. For the countries that witnessed increases in earnings dispersion, the phenomenon was observed within narrowly-defined industries across the entire economy. On the face of things, the latter observation seems to rule out the most naïve of the trade-

related explanations.<sup>4</sup> Trade economists have long argued that the natural framework for thinking about the long-run effect of trade on labour markets, at least from a maintained assumption of competitive markets, is the Stolper-Samuelson theorem and its various generalisations.<sup>5</sup> Simply stated, the implication of the theorem for skilled-labour abundant developed economies is that a reduction in the relative price of unskilled-labour intensive goods caused by more liberal trade with less-developed countries (LDC's) will lower the relative return to unskilled labour in the developed economies and raise it in the LDC's. The simplest trade model therefore predicts that increased trade would worsen the distribution of earnings in developed countries and have the opposite effect on LDC's.<sup>6</sup>

One of the essential claims in much of the popular writing on globalisation, and surely a major source of the general social concern about globalisation, is its potential impact on inequality. The role played by globalisation on labour market outcomes and income inequality in developed countries has been a particularly fertile ground for research during a time when international trade liberalisation has progressed and concerns about imports from low-skill abundant LDC's have been prominent. Some authors, using a variety of methodologies, have found significant labour market effects attributable to increasing import penetration (e.g., Wood, 1994). Rather persuasively Rodrik (1997) argues that it is difficult to believe that there are simultaneously great economic advantages attaching to freer trade and little importance of trade in determining wages (e.g., by arguing that trade is a relatively

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<sup>4</sup> The summary of the proceedings at a conference on earnings trends attended by some of the profession's leading lights revealed the following 'consensus': "*On average, the group attributed 60 percent of the increase in dispersion to technological change, 10 percent to international trade, and 30 percent to other factors such as immigration, the low minimum wage, and changes in corporate wage-setting institutions.*" (Klitgaard and Posen (1995, p.34).

<sup>5</sup> The surveys of this literature are now almost sufficiently numerous to warrant a survey of their own. We make do with a reference to Slaughter's (2000) survey of work explicitly rooted in the Stolper-Samuelson theorem.

<sup>6</sup> The great majority of empirical research on these issues has focussed on developed countries. Possibly as a result of data limitations, there are very few studies of developing countries. However, the studies that have been done seem to indicate that increased openness has coincided with increases, and not decreases, in inequality. See Kanbur (2000) and Attanasio *et al.* (2004). One argument is that imported technology has raised the relative demand for highly skilled labour in LDC's, see Arbache *et al.* (2004), e.g.

small economic force). If one argues that trade is important, as economists are wont to do, it follows that trade must surely also be important for the labour market, income inequality and the distribution of income.

It is a virtually impossible task to disentangle the roles of technical change and international trade in affecting labour market outcomes. For example, globalisation may lower the costs of diffusing new technology and encourage capital for labour as well as skilled for unskilled labour substitution (Johnson and Stafford, 1993). More speculatively, the rate of technical progress may be an endogenous response to the need to maintain competitiveness in a global marketplace. The same argument can obviously be made about deunionisation and the decentralisation of wage bargaining, that are both features of many developed economies, and increasing global competition (see Dreher and Gaston, 2005).

In a similar fashion it is also difficult to disentangle the roles of technical change and foreign direct investment (FDI) in affecting labour market incomes and inequality. Feenstra and Hanson (1996, 1997) argue that FDI has increased the relative demand for skilled workers in both developed *and* developing countries (see also Gaston and Nelson, 2002). Developed countries produce ever increasingly high quality goods, reducing the demand for unskilled workers. However, as the relatively unskilled activities move to the LDC's, the demand for skilled labour in the LDC's increases (since the activities are relatively skilled from an LDC perspective). Hence, FDI may have effects on labour markets similar to the effects implied by skill-biased technological change.

While the search for common factors behind increasing earnings inequality has focussed on the relative demand for workers, explanations for cross-national differences in earnings outcomes have increasingly resorted to stories that emphasise the differences in the impact of various institutions within each country. For example, measures of wage centralisation are generally negatively associated with wage dispersion (Blau and Kahn,

1996). Likewise, higher rates of unionisation and collective bargaining tend to be associated with a lower incidence of low-paid employment and less earnings inequality.<sup>7</sup> In fact, the increases in inequality in recent years have coincided with more decentralised wage bargaining and deunionisation.

The preceding arguments emphasise the need to have a sufficiently broad measure of globalisation if one is to conclude anything tangible about the presence or absence of the effects of globalisation on income inequality. In addition to the more standard supply-and-demand factors and changes in labour market institutions, such as unionisation and the nature of wage determination, Atkinson (1997) argues that changes in *social* norms have also been important. Moreover, trade liberalising policies are often bundled with privatisation and deregulation measures as well as changes to social policies (e.g., Lindert and Williamson, 1991; Cornia, 2003). Overall, the view is that inequality may be adversely affected by social integration, i.e., the variety of non-economic and non-political factors which seemed to have simultaneously affected many economies. For example, Friedman (1999) equates globalisation with “Americanisation”. Hence, if globalisation implies institutional convergence to some common (U.S.) benchmark, then developed country labour markets are in the process of becoming less unionised and less regulated.

There are two competing perspectives on the relationship between the welfare state and globalisation. The first is that globalisation places considerable stress on the welfare state, so that some social and labour market policies will display tendencies of a “race to the bottom”. The effect of globalisation on certain types of workers, particularly organised labour, is also generally taken to be negative. Consequently, this may have negative consequences for the welfare state. For instance, Tanzi (1995) argues that increased mobility

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<sup>7</sup> DiNardo and Lemieux (1997) conclude that the greater deunionisation of the workforce in the United States relative to Canada can explain much of the difference in male earnings inequality between the two countries.

of capital not only erodes the tax base, reducing the welfare state's ability to fund its programmes, but by shifting taxes onto labour, the capacity of the State to redistribute is reduced. In a similar fashion, Garrett (1998) has argued that, by forcing welfare states to resort increasingly to borrowing to fund programmes, the international capital market ends up imposing an increasing premium on large welfare states. In ways that are harder to quantify, but seem *prima facie* plausible, the decreasing cost of the exit option increases the relative power of business in policy-making (Huber and Stephens, 1998). Finally, it has been argued that globalisation increases the general credibility of orthodox (i.e., market-oriented) policy advice, thus reducing the plausibility of arguments supporting welfare state expansion and enhancing the credibility of arguments in favour of welfare state retrenchment (Evans, 1997; Krugman, 1999). Blank and Freeman (1994) argue that some European countries, in the face of increased international competition, tried to reduce the "generosity" of their social programmes (see also Gaston and Nelson, 2004 and Dreher, 2005). In addition, since more mobile capital may cause the tax base to shrink, political as well as economic integration could lessen the State's capacity to redistribute. In turn, this could exacerbate increases in income inequality.

An opposing view is that social policies respond in ways such as to minimise any adverse consequences of globalisation for vulnerable workers. A similar argument is that the classic, large welfare states developed in the context of considerably more open economies than did the smaller, market conforming welfare states (Huber and Stephens, 1998). A plausible story advanced by some authors is that more generous unemployment benefits and changes to cash transfer and income tax systems have arisen to ensure acquiescence by the potential losers from globalisation and microeconomic reforms, such as trade liberalisation (e.g., Rodrik, 1998). That is, greater "progressive" redistribution may be "the price to pay"

for political or social compliance with the labour market and microeconomic reforms necessitated by globalisation.

Interestingly, Bordo *et al.* (1999) carry this argument further, suggesting that the presence of sizable welfare states, and Keynesian macroeconomic policy, may have played an important role in providing sufficient indifference to globalisation, that policies like support for the GATT/WTO system and the Bretton Woods institutions continued even in the face of recessions that might have had system closing consequences in earlier eras. In addition, it has been widely argued that heterogeneity of domestic political, as well as labour market, institutions support heterogeneity of responses to globalisation (Calmfors and Driffill, 1988; Garrett, 1998; Swank, 2002).

If economic integration also fosters political integration, then these two dimensions of globalisation are likely to be highly correlated.<sup>8</sup> Therefore, if political integration is not adequately accounted for, the estimated effect of globalisation represents the joint effect of both dimensions. Since the effects of the two dimensions may go in opposite directions, this could lead to wrongly concluding that the effects of globalisation have been insignificant (see Dreher, 2005). A country's degree of political integration with the rest of the world therefore has to be included in an analysis of economic integration. The same is true for technical and cultural aspects which are also highly correlated with economic integration.<sup>9</sup> In order to get meaningful estimates of the effects of globalisation on income inequality, social and political influences, as well as the factors which economists have traditionally regarded as being the important globalising influences, should be accounted for.

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<sup>8</sup> The correlation between the indices of political and economic integration employed in this study is 0.20.

<sup>9</sup> The correlation between the indices of social and economic integration is 0.58.

<b>Table 1: Predicted effects of globalisation on inequality</b>			
<b>Dimension of globalisation</b>	<b>OECD</b>	<b>LDC's</b>	<b>All</b>
<i>Economic</i>	+	+/-	?
<i>Political</i>	+/0/-	+/-	?
<i>Social</i>	+	?	?
<i>Overall</i>	+?	?	?

Key: Theory predicts: +/0/-/? = positive/zero/negative/unknown effect.

Overall, as table 1 indicates, there is considerable diversity (not to say confusion!) in the views about the effects of globalisation on income inequality. The lack of unambiguous predictions and the high number of conflicting predictions (indicated by ‘+/-’) and question marks in the table highlight, at the very least, the need to add to our empirical knowledge of the facts. The major purpose of this paper is to empirically address the question: *Does globalisation increase inequality?* We next turn to our econometric analysis.

### III. Data and Method

We estimate combined cross-section time-series regressions using two inequality measures as dependent variables. First, we employ the Gini coefficients for gross household income that were recently updated and re-calculated by Francois and Rojas-Romagosa (2005).<sup>10</sup> Our second measure is for industrial pay inequality which is publicly available from the University of Texas Inequality Project (UTIP). It is based on manufacturing wage information compiled by UNIDO and is available for 156 countries.<sup>11</sup> The wage data are either from national statistical sources or the OECD and have been adjusted to allow for

<sup>10</sup> These authors address measurement error problems in the well-known World Bank inequality dataset of Deininger and Squire (1996) and produce a new dataset of consistent inequality series.

<sup>11</sup> Specifically, earnings inequality is measured by Theil's T-statistic, which is given by

$$T = \sum_{p=1}^n \left\{ \left( \frac{1}{n} \right) * \left( \frac{y_p}{\mu_y} \right) * \ln \left( \frac{y_p}{\mu_y} \right) \right\},$$

where  $n$  is the number of individuals in the population,  $y_p$  is the income of person  $p$  and  $\mu_y$  is average income.

international comparability. Apart from the income measure being household- rather than person-based, the main difference between income and earnings is that the former includes the receipt of income from all sources, including capital ownership and government transfers. While changes in earnings inequality and income inequality are highly correlated, much of the theory is couched in terms of one or the other. The literature on the effects of economic integration focusses on the inequality of labour earnings and the impact on the skilled wage premium. In contrast, social and political integration are more likely to affect income, e.g., through their effects on social policies.

All data are averages over five years and cover the period 1970-2000. Since some of the data are not available for all countries or for all periods, the panel is unbalanced and the number of observations depends on the choice of explanatory variables. We found significant fixed country and time effects in all estimated model specifications. However, the coefficients of the country and time effects are not reported in the tables below. All standard errors are estimated robustly. All variables, their precise definitions and data sources, are listed in Appendix B. Appendix C reports descriptive statistics.

For each inequality variable the system of equations to be estimated is

$$y_{it} = \alpha + \beta y_{it-1} + \gamma' G_{it} + \eta' X_{it} + \eta_i + \eta_t + \varepsilon_{it}, \quad (1)$$

where  $y$  represents the natural logarithm of one of two different inequality measures,  $G$  represents the measure of globalisation,  $X$  is a vector of control variables,  $\eta_i$  is a country fixed effect,  $\eta_t$  is a period fixed effect and  $\varepsilon_{it}$  is a random disturbance.

The measure of globalisation that we employ is the index developed in Dreher (2005) for 123 countries. It is based on 23 variables that relate to different dimensions of globalisation. The variables have been combined into six groups: actual flows of trade and investment, restrictions, variables measuring the degree of political integration, data quantifying the extent of personal contact with people living in foreign countries, data

measuring trans-border flows of information and a proxy for cultural integration. These dimensions are combined into three sub-indices and one overall index of globalisation with an objective statistical method.<sup>12</sup> Appendix table 1 reports the individual components. As can be seen, economic, political and social integration obtained roughly equal weights.<sup>13</sup>

We initially restrict the coefficient on the lagged endogenous variable in equation (1) to zero. In choosing our set of control variables, we follow standard practice as much as possible. First, we include per capita GDP and its square (taken from the World Bank's World Development Indicators 2003) to capture the possible presence of a Kuznets-curve effect. We also follow Reuveny and Li (2003) by including an index of democracy (developed by Marshall and Jaggers, 2003) in our baseline model. The recent political science literature has advanced the idea that democracy promotes egalitarianism, due to its use of redistributive and welfare state policies. For example, Reuveny and Li (2003, p.577) argue that democratic governments are more inclined to help the lower and middle classes with progressive taxation, minimum wage laws, price subsidies and public works provision.

The lagged dependent variable is included, because inequality changes only slowly over time instead of being changed instantaneously. However, in the presence of fixed country effects the OLS estimator is biased and inconsistent. To address this, we employ the GMM estimator as suggested by Arellano and Bond (1991). This estimator first-differences the estimating equation and uses lags of the dependent variable from at least the previous two periods as well as lags of the exogenous variables as instruments. Since there are more instruments than right-hand side variables, the equations are over-identified and the

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<sup>12</sup> Specifically, the method is the same as that applied by Gwartney *et al.* (2000), in the construction of their well-known economic freedom index (see also, Gwartney and Lawson, 2003). Appendix A describes the method in more detail.

<sup>13</sup> The underlying method attributes smaller weights to individual components the more components of one category are included. Comparing the results for McDonald's restaurants and FDI, e.g., does not mean that restaurants are more important than FDI. If the analysis included more cultural indicators, the individual weights would be lower.

instruments must be appropriately weighted. We present results from the Arellano-Bond one-step estimator which uses the identity matrix as the weighting matrix. The two-step estimator weights the instruments asymptotically efficiently using the one-step estimates. However, in small samples like the one used here, standard errors tend to be under-estimated by the two-step estimator (Arellano and Bond, 1991, p.291). In all estimations we treat the covariates as strictly exogenous. The next section reports the results.

#### **IV. Results**

Table 2 reports results for the baseline model excluding the lagged dependent variable, while table 3 includes it. The lagged dependent variable is significantly different from zero at least at the ten percent level in all but one equation. However, its inclusion has no qualitative impact on the results.

At the five percent level of significance, the results show that industrial wage inequality in OECD countries rises with globalisation. This reflects the suspicion about the supposed benefits of globalisation held by workers in import-competing and globally vulnerable industries in developed economies. The globalisation coefficient in table 3 indicates that a one-point increase in the globalisation index increases industrial wage inequality by 16 percent. This amounts to a standardised regression (beta) coefficient of 0.23. Overall, the regression models for all countries explain between 27 percent (table 2) and 32 percent (table 3) of the within-groups variation for wage inequality.

Turning to the Gini coefficient, column 2 in tables 2 and 3 reveal that the results are statistically weak. In table 2, the only variable with a significant coefficient is democracy, which has a negative coefficient. However, once the lagged dependent variable is included, democracy no longer exerts a significant impact on inequality. In both tables, none of the variables – per capita GDP, its square or the globalisation index – significantly affect income inequality. The former two findings are in line with recent studies based on the Deininger

and Squire (1996) data set which find almost no support for any relationship between inequality and levels of income.

One caveat to our findings for the Gini coefficient is that the data are only available for a reduced sample of countries. The results are based on a maximum of 57 countries and only 191 observations. This is less than half the number of observations available for industrial wage inequality. In fact, when restricting the specification in column 1 to the sample available in column 2, the globalisation index loses significance. The results may therefore be due to data unavailability rather than indicating that globalisation is unimportant.

For instance, it has been observed that despite increases in the dispersion of earned incomes, in some countries at least, inequality in post-transfer and post-tax income inequality have *not* grown (e.g., Gottschalk and Smeeding, 1997; Aaberge *et al.*, 2000). This suggests that political pressures may have been brought to bear on the generosity of public transfers at a time when earned incomes have become more unequally distributed. From a political economy perspective, the growing inequality of income could be associated with strong compositional effects on the demand for public insurance. In particular, it seems to be the case that the growing size and economic significance of sectors of the economy that pay higher wages for certain types of workers, could somewhat paradoxically result in political pressures that lead to higher levels of transfer payments to disadvantaged workers. It has been suggested that this could result from changes in the identity of the median voter (e.g., Alesina and Rodrik, 1994; Persson and Tabellini, 1994; Saint-Paul and Verdier, 1996) or as an optimal response to increased income risk in an increasingly open economy (e.g., Rodrik, 1998).

The last four columns in each of table 2 and table 3 report results for OECD and non-OECD countries separately. The reduced sample size implies a reduction in the number of statistically significant coefficients. The results for wage inequality show that the

globalisation index remains significant at the five percent level in OECD countries, while there is no significant impact of globalisation on inequality in non-OECD countries. In OECD countries, a one-point increase in the globalisation index increases wage inequality by between 21 and 26 percent, which amounts to a beta coefficient of between 0.34 and 0.40.

Table 4 reports results using the GMM estimator. This leads to a dramatic loss of observations, since information from two periods is lost due to differencing and instrumenting. Consequently, the t-statistics are generally lower. In particular, the globalisation index is no longer significant in the overall sample. The impact of globalisation in the OECD sample, however, remains significant at the ten percent level, with a quantitative impact similar to those of the full sample.

For the GMM estimator, we can conduct a Sargan test on the validity of the instruments used. This amounts to a test for the exogeneity of the covariates. As can be seen, the Sargan test accepts the over-identifying restrictions at the one percent level in all regressions. The Arellano-Bond test of second order autocorrelation, which must be absent from the data in order for the estimator to be consistent, also accepts the specifications at the ten percent level of significance.

It should be noted that the time dummies, which are not reported in the tables, were always statistically significant. We also employed a time trend instead of the period dummies. However, replacing the time dummies with a time trend in all model specifications generally leads to more poorly-fitting models (see next section). Taken together our results lend some credence to the view that, while income and earnings inequality have not been inexorably trending, that changes in inequality have been not been “glacial”. The “inverted U” hypothesis introduced by Kuznets, which argues that inequality rises in the early stages of industrialisation, but declines in later stages receives no support, as expected. The negative influence of democracy, on the other hand, is more difficult to explain, in part because it

conflicts with previous findings in the political science literature (e.g., Reuveny and Li, 2003). What we find is that having more democratic governments does not necessarily lead to greater redistribution, but rather to more market-oriented policies along the lines discussed in section II. This is what Heckelman and Knack (2005) show, i.e., an increase in democracy is significantly associated with market-oriented reforms.

Tables 5 to 7 replicate the above analysis by replacing the aggregate globalisation index by the sub-indices for the three dimensions of globalisation. The results again show that globalisation does not affect the Gini coefficient for OECD countries. For non-OECD countries, there is some evidence that political globalisation has increased inequality. When the lagged dependent variable is included, social globalisation reduces inequality, at the one percent level of significance.

With regard to wage inequality, the results lack consistency across specifications and methods of estimation. The correlations between the three dimensions of globalisation make their impact difficult to disentangle. When the lagged dependent variable is included, all the economic and political dimensions of globalisation have worsened wage inequality in OECD countries. Overall, our results generally lend support to the claim that economic, social and to some extent political integration have increased inequality in OECD countries. In non-OECD countries no dimension of globalisation appears to have had a significant impact (i.e., once the influence of the lagged dependent variable is taken into account).

## **V. Further Discussion**

At a minimum, our results show some support for the hypothesis that globalisation increases inequality in OECD countries. In this section we further discuss our results and present extensions as well as tests for their robustness. We restrict our discussion to the robustness of the various globalisation coefficients. Furthermore, we focus on industrial wage inequality, as our analysis does not reveal any significant impact of globalisation on

income inequality, at least measured by Gini coefficients. All regressions include the lagged endogenous variable.

As a first test, we replicate all regressions (estimated by OLS) omitting – one at a time – the following sub-groups: East Asian and Pacific countries, Latin American and Caribbean countries, Sub-Saharan-African countries and, finally, India and China.

Secondly, we replicate the analysis for different sets of sub-groups. We separate countries with British and French legal origin. We also stratify our sample of countries into low income, middle income and high income.<sup>14</sup>

Thirdly, we include additional variables which could influence the relationship between globalisation and inequality. We use the age dependency ratio, measured as the percentage of the population younger than fifteen years or older than sixty-four years, to control for demographic influences. While related to the dependency ratio, we also use population growth. This variable may more explicitly capture demographic aging influences which may influence, among other things, pension entitlements. Population growth is also likely to be correlated with the growth in a country's labour endowment. Finally, we use the size of government, measured by government expenditure as a share of GDP, to account for the provision of public goods, the degree of intervention in the market-place and the possible use of redistributive expenditures. As mentioned in section II, one school of thought argues that any potentially adverse effects of globalisation have been largely neutralised by government spending on social and labour market programmes.

And finally, as mentioned briefly in the previous section, we substitute the fixed period dummies by a trend variable.

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<sup>14</sup> Country classifications are taken from Easterly and Sewadeh (2001), so that countries are classified according to their per capita GNI in 2000, calculated using the World Bank Atlas method. The groups are: low income, \$755 or less; middle income, \$756 to \$9,265; and high income, \$9,266 and above.

Tables 8 to 10 show the results of the sensitivity analysis using the overall index of globalisation. Table 8 contains the results for the various sub-groups described above. Note that the significant impact of the globalisation index on wage inequality is robust to the exclusion of our various country groups. When split according to French legal origin, globalisation does not enter either regression with a significant coefficient. In countries with British legal origin the positively significant impact remains, with a substantially increased coefficient. The coefficient shows that a one-point increase in the globalisation index increases industrial wage inequality by almost 28 percent, implying a beta coefficient of 0.38. When the sample is split according to income strata, globalisation only increases inequality in middle income countries. In high and low income countries no significant impact of globalisation is apparent.

Table 9 adds the additional covariates. The results show that the age dependency ratio does not significantly affect inequality at conventional levels of significance. In the overall sample and in non-OECD countries, inequality is declining with a higher population growth, while higher government consumption decreases inequality in OECD countries (with coefficients significant at least at the five percent level). In the latter case, controlling for government expenditure in a regression setting does *not* increase the impact of globalisation, as would be expected if government expenditure rises to compensate the losers from globalisation. Most important for our analysis, the index of globalisation remains significant in the overall and the OECD sample (with the coefficients being significant at the ten percent level in column 1 and at the five percent level in the other columns of table 9).

Table 10 replaces the period dummies by a linear trend variable. As can be seen, the trend term is significant in the overall and the Non-OECD sample, with a positive coefficient significant at the one percent level. The size of the coefficients indicates that over the sample

period inequality increased by about 10 percent every five years. The results also show that the impact of globalisation remains.

To sum up, our results are surprisingly robust to the exclusion of countries, the inclusion of additional variables and the substitution of the time period dummies by a time trend.

As a final exercise, we replicate the stability tests for the globalisation sub-indices. However, to save space we only report one table including the sign and levels of significance of the globalisation indices. As can be seen from table 11, the results are consistent with those reported in table 6. In particular, economic and political integration have been important for increases in wage inequality.

## **VI. Conclusion**

As can sometimes be the case, theory has run well ahead of empirical work when it comes to understanding the impact of globalisation on the inequality of income or earnings. In addition, the proliferation of theories has yielded considerable uncertainty about what exactly are the predicted effects of globalisation on inequality in both developed and developing countries. Theory has predicted that globalisation may have beneficial, adverse or insignificant effects on income or earnings inequality. Moreover, the economics profession has tended to be narrowly focussed on the more measurable dimensions of economic globalisation and market integration, in particular, the liberalisation of international trade. However, it seems clear that globalisation is multi-faceted. Recent research increasingly identifies the fact that changes to social institutions and political integration may be equally important elements of the widespread concern about globalisation. This research suggests that globalisation has effects on the returns to labour market participation and

therefore earnings and income inequality that work through its effects on labour market and political institutions, to say nothing of social norms.<sup>15</sup>

In this paper we use panel data on industrial wage inequality, the Gini coefficient as well as measures of the economic, social and political dimensions of globalisation to examine this controversial issue. The major impetus of the paper is to attempt to reduce the empirical fog. Needless to say our results will be far from being the “final word” on the topic. However, our findings are interesting and hopefully provocative. They should provide a platform for further research – both empirical and theoretical.

We found that the economic dimension of globalisation has exacerbated industrial wage inequality in developed countries. To a lesser degree, the political and social dimensions of globalisation also appear to have been factors behind increased wage inequality. In contrast, we found that the impact of globalisation on inequality in less-developed countries has been quite small. Our findings therefore provide an empirical “justification” for Bhagwati’s (1999) observation that it is the developed countries, rather than the developing countries, that oppose greater integration. That is, the developed countries do so because of increased inequality and the implied political consequences in their economies.

Finally, some of our ancillary findings are also noteworthy. As is increasingly the case, we find no evidence of a Kuznets curve for developed or developing economies. In addition, and in contrast to the work of political scientists, we find that greater democracy has *not* decreased income inequality or earnings inequality. In fact, there’s more evidence that it may have actually increased inequality. On the face of things this finding may be more in line with the view that less centralised government’s have adopted more market-oriented

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<sup>15</sup> Gaston and Nelson (2004) refer to these as the *indirect effects* of globalisation, while we refer to them as the political and social dimensions of globalisation.

policies and have not resorted to greater redistribution as argued by political scientists. This issue deserves further investigation in our opinion. The other issue which we have been unable to successfully resolve is our contrasting findings for income inequality and wage inequality. Based on our data, a conclusion that globalisation has had no discernible impact on income inequality – at least as measured by Gini coefficients – strikes us as being largely beyond dispute. On the other hand, globalisation does appear to have affected wage inequality in the developed economies at least. Further research to resolve this conundrum is also a fertile pursuit.

**Table 2: Inequality and Globalisation, 1970-2000, OLS, fixed effects**

	wage	income	wage	income	wage	income
Globalisation, index	0.170 (2.26**)	0.021 (0.89)	0.208 (2.06**)	1.190 (1.07)	0.157 (1.45)	0.035 (0.92)
Democracy, index	0.037 (2.76***)	-0.007 (1.84*)	0.033 (1.00)	-0.465 (1.60)	0.036 (2.56**)	-0.003 (0.57)
GDP per capita	-1.46E-04 (4.59***)	-1.74E-06 (0.22)	-8.81E-05 (1.26)	1.08E-03 (0.85)	-2.47E-04 (4.64***)	-9.11E-06 (0.33)
GDP per capita (squared)	2.86E-09 (4.48***)	-8.19E-11 (0.52)	1.66E-09 (1.50)	-1.84E-08 (1.09)	5.79E-09 (3.56***)	2.03E-10 (0.19)
Number of countries	106	57	27	21	79	36
Number of observations	486	191	145	79	341	112
Group	all	all	OECD	OECD	Non-OECD	Non-OECD
R squared (within)	0.27	0.14	0.35	0.22	0.28	0.15

\*denotes significant at 10% level; \*\* significant at 5% level; \*\*\* significant at 1% level.

**Table 3: Inequality and Globalisation, 1970-2000, OLS, fixed effects**

	wage	income	wage	income	wage	income
Globalisation, index	0.162 (2.01**)	0.015 (0.53)	0.256 (2.57**)	0.002 (0.09)	0.110 (0.96)	0.020 (0.50)
Democracy, index	0.039 (2.66***)	-0.007 (1.03)	0.087 (2.74***)	-0.025 (1.60)	0.021 (1.44)	-0.002 (0.27)
GDP per capita	-9.83E-05 (2.53**)	-7.79E-06 (0.68)	-4.51E-05 (0.67)	-3.87E-06 (0.17)	-2.49E-04 (3.89***)	-2.81E-05 (0.66)
GDP per capita (squared)	2.18E-09 (2.97***)	-4.06E-12 (0.02)	1.08E-09 (1.06)	-1.87E-11 (0.06)	6.39E-09 (3.26***)	7.75E-10 (0.51)
Lagged endogenous	0.202 (2.50**)	-0.127 (1.09)	0.505 (3.30***)	0.285 (1.84*)	0.178 (1.98**)	-0.312 (2.44**)
Number of countries	100	43	27	19	73	24
Number of observations	411	128	129	54	282	74
Group	all	all	OECD	OECD	Non-OECD	Non-OECD
R squared (within)	0.32	0.24	0.55	0.42	0.31	0.30

\* denotes significant at 10% level; \*\* significant at 5% level; \*\*\* significant at 1% level.

**Table 4: Inequality and Globalisation, 1970-2000, GMM**

	wage	income	wage	income	wage	income
Globalisation, index	0.152 (1.27)	0.017 (0.63)	0.169 (1.79*)	0.017 (0.90)	0.098 (0.53)	0.061 (1.22)
Democracy, index	0.039 (2.06**)	-0.003 (0.22)	0.056 (2.02**)	-0.017 (1.93*)	0.020 (1.06)	0.001 (0.08)
GDP per capita	-4.47E-05 (0.91)	-2.50E-05 (1.88*)	-3.37E-05 (0.65)	-2.58E-06 (0.13)	-9.82E-05 (0.63)	-6.10E-05 (1.42)
GDP per capita (squared)	2.06E-09 (1.60)	3.21E-10 (1.31)	1.47E-09 (1.27)	-3.39E-11 (0.12)	2.19E-09 (0.47)	1.78E-09 (1.25)
Lagged endogenous	0.655 (2.3**)	0.031 (0.23)	1.194 (3.32***)	0.131 (1.02)	0.484 (1.96**)	-0.151 (1.15)
Constant	-0.146 (1.28)	0.038 (1.28)	-0.040 (0.36)	-0.025 (1.02)	0.051 (0.68)	0.042 (1.34)
Number of countries	91	34	26	14	65	20
Number of observations	276	78	93	33	183	45
Group	all	all	OECD	OECD	Non-OECD	Non-OECD
Sargan test (prob>chi2)	0.38	0.26	0.47	0.82	0.18	0.25
Arellano Bond test (pr>z)	0.23	0.35	0.06	0.98	0.11	0.38

\* denotes significant at 10% level; \*\* significant at 5% level; \*\*\* significant at 1% level.

**Table 5: Inequality and Dimensions of Globalisation, 1970-2000, OLS, fixed effects**

	wage	income	wage	income	wage	income
Economic globalisation, index	0.096 (2.37**)	0.005 (0.37)	0.115 (1.21)	-0.057 (0.05)	0.089 (1.94*)	0.001 (0.10)
Social globalisation, index	0.013 (0.27)	0.005 (0.39)	0.086 (1.77*)	0.682 (1.09)	-0.173 (1.49)	-0.111 (1.63)
Political globalisation, index	0.043 (1.33)	0.007 (0.72)	0.054 (1.37)	-0.101 (0.20)	0.036 (0.73)	0.032 (1.77*)
Democracy, index	0.035 (2.61***)	-0.007 (1.73*)	0.031 (0.90)	-0.401 (1.27)	0.032 (2.34**)	-0.003 (0.56)
GDP per capita	-1.43E-04 (4.30***)	-3.31E-07 (0.04)	-9.25E-05 (1.32)	1.14E-03 (0.84)	-1.91E-04 (2.98***)	3.91E-06 (0.14)
GDP per capita (squared)	2.89E-09 (4.11***)	-1.21E-10 (0.73)	1.77E-09 (1.54)	-2.00E-08 (1.12)	4.75E-09 (2.69***)	6.04E-10 (0.53)
Number of countries	106	57	27	21	79	36
Number of observations	484	190	144	78	340	112
Group	all	all	OECD	OECD	Non-OECD	Non-OECD
R squared (within)	0.27	0.14	0.34	0.22	0.30	0.20

\* denotes significant at 10% level; \*\* significant at 5% level; \*\*\* significant at 1% level.

**Table 6: Inequality and Dimensions of Globalisation, 1970-2000, OLS, fixed effects**

	wage	income	wage	income	wage	income
Economic globalisation, index	0.084 (2.05**)	-0.025 (0.64)	0.179 (1.93*)	-0.025 (0.64)	0.058 (1.26)	-0.014 (0.89)
Social globalisation, index	-0.004 (0.08)	-0.020 (0.96)	0.096 (1.95*)	-0.020 (0.96)	-0.204 (1.58)	-0.170 (3.11***)
Political globalisation, index	0.053 (1.66*)	0.013 (1.10)	0.071 (1.94*)	0.013 (1.10)	0.041 (0.78)	0.035 (1.90*)
Democracy, index	0.037 (2.53**)	-0.027 (1.61)	0.078 (2.20**)	-0.027 (1.61)	0.019 (1.32)	-0.002 (0.32)
GDP per capita	-8.90E-05 (2.14**)	2.99E-06 (0.12)	-4.54E-05 (0.70)	2.99E-06 (0.12)	-1.68E-04 (2.03**)	1.56E-05 (0.40)
GDP per capita (squared)	2.11E-09 (2.63***)	-1.49E-10 (0.40)	1.10E-09 (1.05)	-1.49E-10 (0.40)	4.66E-09 (2.13**)	5.83E-10 (0.42)
Lagged dependent variable	0.206 (2.53**)	0.241 (1.50)	0.520 (3.08***)	0.241 (1.50)	0.174 (1.93*)	-0.320 (2.82***)
Number of countries	100	43	27	19	73	24
Number of observations	410	127	128	53	282	74
Group	all	all	OECD	OECD	Non-OECD	Non-OECD
R squared (within)	0.32	0.28	0.55	0.59	0.33	0.48

\* denotes significant at 10% level; \*\* significant at 5% level; \*\*\* significant at 1% level.

**Table 7: Inequality and Dimensions of Globalisation, 1970-2000, GMM**

	wage	income	wage	income	wage	income
Economic globalisation, index	0.038 (0.52)	0.001 (0.04)	0.210 (2.60***)	0.008 (0.24)	0.012 (0.14)	0.013 (1.02)
Social globalisation, index	0.062 (0.69)	-0.028 (1.50)	0.113 (1.73*)	-0.008 (0.39)	-0.045 (0.19)	-0.172 (3.55***)
Political globalisation, index	0.051 (2.02**)	0.021 (1.78*)	0.025 (0.80)	0.012 (0.92)	0.069 (1.47)	0.038 (1.82*)
Democracy, index	0.039 (2.04**)	-0.004 (0.36)	0.041 (1.21)	-0.023 (2.70***)	0.021 (1.09)	-0.005 (0.52)
GDP per capita	-3.02E-05 (0.53)	-1.03E-05 (0.96)	-1.23E-05 (0.28)	5.82E-06 (0.29)	-7.05E-05 (0.40)	-2.01E-05 (0.58)
GDP per capita (squared)	1.65E-09 (1.15)	1.16E-10 (0.53)	8.89E-10 (0.78)	-1.88E-10 (0.60)	1.48E-09 (0.29)	2.01E-09 (1.88*)
Lagged endogenous	0.675 (2.33**)	0.008 (0.06)	1.210 (3.36***)	0.125 (0.79)	0.476 (1.87*)	-0.238 (1.57)
Constant	0.092 (1.67*)	0.068 (1.82*)	-0.131 (0.92)	0.019 (0.88)	0.071 (0.62)	0.044 (1.49)
Number of countries	91	34	26	14	65	20
Number of observations	275	77	92	32	183	45
Group	all	all	OECD	OECD	Non-OECD	Non-OECD
Sargan test (prob>chi2)	0.41	0.13	0.26	0.80	0.22	0.53
Arellano Bond test (pr>z)	0.24	0.34	0.06	0.80	0.11	0.29

\* denotes significant at 10% level; \*\* significant at 5% level; \*\*\* significant at 1% level.

**Table 8: Industrial Wage Inequality and Globalisation, 1970-2000, OLS**

	No East Asia/Pacific	No LAC	No SSA	No India /China	French Origin	No French Origin	British Origin	No British Origin	Low Income	Middle Income	High Income
Globalisation, index	0.154 (1.83*)	0.223 (2.45**)	0.193 (2.03**)	0.165 (2.03**)	0.152 (1.27)	0.174 (1.54)	-0.048 (0.35)	0.275 (2.45**)	-0.010 (0.07)	0.286 (1.92*)	0.129 (1.30)
Democracy, index	0.058 (3.59***)	0.056 (2.75***)	0.044 (2.59***)	0.038 (2.62***)	0.023 (1.58)	0.066 (2.81***)	-0.014 (0.64)	0.068 (3.90***)	-0.012 (0.51)	0.053 (2.48**)	0.061 (0.65)
GDP per capita	-2.06E-05 (0.42)	-7.97E-05 (1.91*)	-1.01E-04 (2.37**)	-1.01E-04 (2.58***)	-9.13E-05 (1.37)	-1.15E-04 (2.29**)	-1.03E-04 (1.89*)	-1.22E-04 (2.44**)	-1.44E-03 (0.90)	-2.15E-04 (1.11)	-3.85E-05 (0.60)
GDP per capita (squared)	5.53E-10 (0.51)	1.95E-09 (2.54**)	2.15E-09 (2.79***)	2.20E-09 (2.99***)	2.10E-09 (1.48)	2.36E-09 (2.75***)	2.80E-09 (2.65***)	2.67E-09 (2.78***)	8.89E-07 (0.70)	1.55E-09 (0.11)	1.31E-09 (1.30)
Lagged endogenous	0.152 (1.78*)	0.286 (3.07***)	0.165 (1.87*)	0.199 (2.45**)	0.172 (1.86*)	0.252 (1.89*)	0.257 (1.89*)	0.148 (1.51)	0.387 (2.84***)	0.113 (0.97)	0.289 (2.36**)
Number of countries	88	80	78	98	50	46	29	67	26	48	26
Number of observations	352	332	331	404	205	199	133	271	97	128	132
R squared (within)	0.34	0.33	0.32	0.32	0.36	0.35	0.35	0.38	0.40	0.37	0.33

\* denotes significant at 10% level; \*\* significant at 5% level; \*\*\* significant at 1% level.

**Table 9: Industrial Wage Inequality and Globalisation, 1970-2000, OLS**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Globalisation, index	0.154 (1.93*)	0.250 (2.51**)	0.109 (0.96)	0.166 (2.06**)	0.256 (2.55**)	0.118 (1.01)	0.164 (1.99**)	0.216 (2.12**)	0.114 (0.95)
Democracy, index	0.040 (2.76***)	0.091 (2.86***)	0.021 (1.46)	0.040 (2.71***)	0.088 (2.66***)	0.022 (1.52)	0.039 (2.62***)	0.090 (3.06***)	0.021 (1.45)
GDP per capita	-9.27E-05 (2.44**)	-3.57E-05 (0.57)	-2.39E-04 (3.79***)	-9.85E-05 (2.55**)	-4.56E-05 (0.67)	-2.56E-04 (3.93***)	-9.83E-05 (2.53**)	-9.16E-05 (1.55)	-2.55E-04 (3.94***)
GDP per capita (squared)	1.93E-09 (2.73***)	8.94E-10 (0.96)	5.88E-09 (2.98***)	2.20E-09 (3.02***)	1.08E-09 (1.06)	6.65E-09 (3.29***)	2.18E-09 (2.97***)	1.61E-09 (1.77*)	6.67E-09 (3.28***)
Age dependency ratio	0.897 (1.50)	0.507 (0.50)	1.093 (1.63)						
Population growth				-0.012 (2.10**)	0.011 (0.12)	-0.011 (2.84***)			
Government consumption (percent of GDP)							0.000 (0.03)	-0.087 (3.03***)	0.007 (0.84)
Lagged endogenous	0.201 (2.49**)	0.510 (3.37***)	0.171 (1.90*)	0.197 (2.41**)	0.504 (3.23***)	0.172 (1.89*)	0.203 (2.50**)	0.410 (3.02***)	0.176 (1.96*)
Number of countries	100	27	73	100	27	73	100	27	73
Number of observations	411	129	282	411	129	282	410	129	281
Group	all	OECD	Non-OECD	all	OECD	Non-OECD	all	OECD	Non-OECD
R squared (within)	0.33	0.56	0.32	0.32	0.55	0.31	0.32	0.60	0.31

\* denotes significant at 10% level; \*\* significant at 5% level; \*\*\* significant at 1% level.

**Table 10: Industrial Wage Inequality and Globalisation, 1970-2000, OLS**

	(1)	(2)	(3)
Globalisation, index	0.153 (2.52**)	0.166 (1.80*)	0.141 (1.61)
Democracy, index	0.041 (2.83***)	0.082 (2.28**)	0.028 (1.95*)
GDP per capita	-9.79E-05 (2.54**)	-2.75E-05 (0.39)	-2.59E-04 (4.04***)
GDP per capita (squared)	2.19E-09 (3.01***)	8.95E-10 (0.82)	6.81E-09 (3.49***)
Lagged endogenous	0.207 (2.68***)	0.345 (2.67***)	0.176 (1.94*)
Trend term	0.083 (3.38***)	0.063 (0.89)	0.102 (3.45***)
Number of countries	100	27	73
Number of observations	411	129	282
Group	all	OECD	Non-OECD
Method	OLS	OLS	OLS
R squared (within)	0.31	0.49	0.29

\* denotes significant at 10% level; \*\* significant at 5% level; \*\*\* significant at 1% level.

**Table 11: Industrial Wage Inequality and Dimensions of Globalisation, 1970-2000, OLS**

	Economic	Social	Political	Economic		Social		Political									
	all	all	all	OECD	Non-OECD	OECD	Non-OECD	OECD	Non-OECD								
<b>Excluding</b>																	
East Asia/Pacific	+, 10	insig.	+, 10														
Latin America and Caribbean	+, 1	insig.	+, 10														
Sub-Sahara Africa	+, 5	insig.	+, 10														
India /China	+, 5	insig.	+, 10														
French origin	insig.	insig.	insig.														
British origin	+, 5	insig.	+, 10														
<b>Including</b>																	
French origin only	insig.	insig.	insig.														
British origin only	insig.	insig.	insig.														
Low income only	insig.	insig.	+, 10														
Middle income only	insig.	insig.	+, 10														
High income only	insig.	insig.	insig.														
Age dependency ratio	+, 5	insig.	insig.	+, 10	insig.	+, 10	-, 10	+, 10	insig.								
Population growth	+, 5	insig.	insig.	+, 10	insig.	+, 10	insig.	+, 10	insig.								
Government consumption	+, 5	insig.	+, 10	+, 5	insig.	insig.	-, 10	insig.	insig.								

**Key:** All regressions include the index of democracy, GDP per capita and its square, and the lagged dependent variable. +/- indicates positive/negative coefficients, followed by the level of the coefficients' significance.

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### Appendix Table 1: Components of the index of globalisation

<b>A.</b>	<b>Data on economic integration</b>	<b>[35%]</b>
	i) Actual flows	(50%)
	Trade (in percent of GDP)	(23%)
	Foreign direct investment (in percent of GDP)	(29%)
	Portfolio investment (in percent of GDP)	(27%)
	Income payments to foreign nationals (in percent of GDP)	(22%)
	ii) Restrictions	(50%)
	Hidden import barriers	(20%)
	Mean tariff rate	(30%)
	Taxes on international trade (in percent of current revenue)	(24%)
	Capital account restrictions	(26%)
<b>B.</b>	<b>Data on political engagement</b>	<b>[28%]</b>
	Embassies in country	(34%)
	Membership in international organisations	(34%)
	Participation in UN Security Council missions	(32%)
<b>C.</b>	<b>Data on social globalisation</b>	<b>[38%]</b>
	i) Data on personal contact	(24%)
	Outgoing telephone traffic	(31%)
	Transfers (in percent of GDP)	(9%)
	International tourism	(1%)
	Telephone average costs of call to USA	(33%)
	Foreign population (in percent of total population)	(26%)
	ii) Data on Information Flows	(39%)
	Telephone mainlines (per 1000 people)	(18%)
	Internet hosts (per capita)	(15%)
	Internet users (as a share of population)	(18%)
	Cable television (per 1000 people)	(16%)
	Daily newspapers (per 1000 people)	(16%)
	Radios (per 1000 people)	(17%)
	iii) Data on cultural proximity	(37%)
	Number of McDonald's restaurants (per capita)	(100%)

Notes: The number in parentheses indicates the weight used to derive the indices. Weights may not sum to 100 because of rounding.

Source: Dreher (2006).

## Appendix A: Construction of the index of globalisation

To construct the indices of globalisation, each variable (of Appendix table 1) is converted into an index with a zero to ten scale. Higher values denote greater globalisation. When higher values of the original variable indicate higher globalisation, the formula  $((V_i - V_{min}) / (V_{max} - V_{min}) * 10)$  is used for transformation. Conversely, when higher values indicate less globalisation, the formula is  $((V_{max} - V_i) / (V_{max} - V_{min}) * 10)$ . This is the procedure employed by Gwartney *et al.* (2002) in the construction of their economic freedom index. The weights for the sub-indices were calculated using principal components analysis. The year 2000 was the base year. For this year, the analysis partitions the variance of the variables used. The weights are then determined in a way that maximises the variation of the resulting principal component, so that the index captures the variation as fully as possible. If possible, the weights determined for the base year are then used to calculate the indices for each single year back to 1970. Where no data are available, the weights are readjusted to correct for this. Dreher (2006) provides greater details of the method employed.

## Appendix B: Sources and Definitions

Variable	Description	Source
Globalisation, index	Index constructed with Principal Components Analysis comprising 23 variables measuring globalisation.	Dreher (2006)
Economic globalisation, index	Sub-index comprising measures of actual economic flows and restrictions, on a range from 1 to 10, with higher values representing more globalisation.	Dreher (2006)
Social globalisation, index	Sub-index comprising data on political engagement, on a range from 1 to 10, with higher values representing more globalisation.	Dreher (2006)
Political globalisation, index	Sub-index comprising data on personal contacts, information flows, and cultural proximity, on a range from 1 to 10, with higher values representing more globalisation.	Dreher (2006)
Industrial payments inequality (log)	Earnings inequality measured using Theil's T-statistic. The T-statistic is given by $T = \sum_{p=1}^n \left\{ \left( \frac{1}{n} \right) * \left( \frac{y_p}{\mu_y} \right) * \ln \left( \frac{y_p}{\mu_y} \right) \right\},$ where n is the number of individuals in the population, $y_p$ is the income of person p and $\mu_y$ is average income.	University of Texas Inequality Project (UTIP)
Gini coefficient (log)	Gini coefficients for gross household income.	Francois and Rojas-Romagosa (2005)
Democracy, index	Measures the general openness of political institutions on the scale 0-10 (0 = low; 10 = high).	Marshall and Jaggers (2003)
GDP per capita	Measured in constant 2000 US\$.	World Bank (2005)
GDP per capita (squared)		World Bank (2005)
Age dependency ratio	Number of dependents relative to working-age population.	World Bank (2005)
Population growth	Annual growth rate in percent.	World Bank (2005)
Government consumption	General government final consumption expenditure in percent of GDP.	World Bank (2005)

### Appendix C: Descriptive Statistics

Variable	Mean	Minimum	Maximum	Standard Deviation
Globalisation, index	2.46	0.21	6.48	1.26
Economic globalisation, index	3.31	0.00	8.84	1.65
Social globalisation, index	1.23	0.01	6.56	1.28
Political globalisation, index	3.08	0.00	8.58	1.81
Industrial payments inequality (log)	-3.24	-6.38	-0.72	0.96
Gini coefficient (log)	3.66	3.02	4.14	0.26
Democracy, index	4.68	0.00	10.00	4.23
GDP per capita	5303	45	46473	7783
GDP per capita (squared)	88600000	1992	2160000000	226000000
Age dependency ratio	0.74	0.37	1.19	0.19
Population growth	1.82	-44.41	16.45	2.01
Government consumption	16.79	4.13	62.90	7.30