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Globalization, Economic Freedom, and Wage Inequality: A Panel Data Analysis

Summary: This paper examines the impact of globalization and liberalization on wage inequality using the KOF globalization index, the Economic Freedom Index (EFI) of the Fraser Institute and the Theil industrial pay inequality statistic compiled by the University of Texas Inequality Project (UTIP). Both static and dynamic fixed-effects models are estimated using a 5-year panel data set consisting of about 90 developed and developing countries for the 1970–2005 period. Estimation results from the dynamic panel data specification suggest that wage inequality has a significant and slowly changing component. The overall KOF and EFI indexes are found to be statistically insignificant in the full sample, but the results show that economic freedom is associated with more wage inequality, especially in Organisation for Economic Co-operation and Development (OECD) countries. The estimation results from country groups indicate that more deregulation is associated with more earnings inequality in OECD countries. The results from the models with subcomponents of the EFI imply that access to sound money has a negative effect on wage inequality. A more stable price system in an economy implies a more equal wage distribution in emerging markets (EM), non-OECD countries, and European Union (EU).

Key words: Wage inequality, Globalization, Economic freedom.

JEL: C82, D30, D63, F15.

The purpose of this paper is to empirically examine the relationship between within-country industrial wage inequality and composite indices of globalization and economic freedom using a cross-country panel data set. Although there is a sizable literature on the nexus among globalization, liberalization, and inequality, many studies typically employ narrow measures of globalization and liberalization neglecting their multifaceted nature. Accordingly, the number of studies focusing on the impact of different dimensions of globalization and economic freedom on wage inequality is rather limited. Furthermore, the link between industrial earnings inequality and the extent and degree of economic freedom has not been examined in a cross-country panel data context in the empirical literature. This paper aims to fill this gap. More specifically, this paper attempts to answer the following question: Is there a statistically and economically significant relationship between wage inequality and the measures of globalization and liberalization? To answer that question, we construct-

ed a cross-country panel data set on the measures of globalization and liberalization with 5-year frequency and estimate both static and dynamic models of inequality accompanied with several sensitivity tests.

This paper is organized as follows. Section 1 gives a summary of the potential theoretical channels through which globalization/liberalization may affect wage inequality. Section 2 provides a brief summary of existing empirical literature. Section 3 describes the data and econometric methodology. Section 4 presents the empirical results. Section 5 provides the summary and conclusions.

1. Globalization, Liberalization, and Wage Inequality

Globalization is generally described as the process by which national economies become more interdependent and highly integrated through trade, capital flows, migration, social and political interaction and the spread of information and technology. This definition reflects the multifaceted nature of globalization which may not be appropriately measured by narrow indicators widely used in the literature such as the reduction of borders hindering the flow of goods, services and capital, the growth in the volume of goods, services and capital flows, foreign direct investments (FBIs), outsourcing, and increases in exchange rate volatility and in immigration (Emma Aisbett 2003, 2004, 2007; Pinelopi K. Goldberg and Nina Pavcnik 2007). The recent global experience also suggests that the process of globalization generally unfolds together with the increasing degree of economic freedom/liberalization in countries. Similar to the concept of globalization, economic freedom has several dimensions that may have different influence on wage inequality.

There are several direct and indirect channels through which globalization and liberalization can affect within-country wage inequality. Globalization tends to raise the demand for and wage of the skilled workers against the unskilled workers and eventually leads to widening wage inequality — the so-called "skill premium". The first group of channels that may lead to "skill premium" includes foreign trade channel and capital flows channel. The second group of channels arises through the effects on technological advances, changes in labor market institutions, and company organizations, which are the more indirect reflections of globalization. It is commonly agreed recently that none of those factors are effective alone, but their interaction with each other accelerates inequality (Daron Acemoğlu 2002).

The Heckscher-Ohlin theorem (factor endowment theory) is a well-known general equilibrium model of international trade that, together with the Stolper-Samuelson theorem, provides the analytical nexus between trade openness and wage inequality. In its most stylized version with two factors of production (skilled and unskilled labor) and two identical countries with no international factor mobility, the model predicts that unskilled-labor-intensive goods are produced in unskilled-labor-abundant countries, whereas skilled-labor-abundant countries specialize in skilled-labor-intensive goods. Overall, according to the Heckscher-Ohlin-Stolper-Samuelson (HOSS) framework, trade specialization will benefit unskilled labor and reduce wage dispersion in developing countries, which generally tend to be abundant in unskilled labor compared to developed countries. This argument is generally used to support trade liberalization in developing countries. In skilled-labor-abundant developed

countries, however, the HOSS framework predicts that the wages of skilled labor will increase as a result of trade, whereas the wages of unskilled labor will decline leading to an increase in income inequality (Goldberg and Pavcnik 2007).

However, the outcomes of globalization and trade openness in the last 25 years hardly confirm the predictions of the theory (Eddy Lee and Marco Vivarelli 2006). On the contrary, income and wage inequality have increased especially in developing countries, and the demand for and wages of skilled labor and skill premium have increased considerably. It has been argued that the assumptions of the basic HOSS theorem are too restrictive to explain the real world and the distributional consequences of trade liberalization may be difficult once they are relaxed (Elena Meschi and Marco Vivarelli 2009).

Besides the HOSS framework, there are several approaches proposed to explain the global rise in the skill premium. First, because rich and poor countries differ significantly in their purchasing power, the demand for the goods produced by countries with abundant unskilled labor by high-income countries will be low (Michael Kremer and Eric Maskin 2006). In other words, it is highly probable that poor countries buy unskilled-labor-intensive goods from poor countries, whereas rich countries buy skilled-labor-intensive goods from other rich countries. This model provides an explanation as to why poor countries may not benefit from globalization.

Second, it is argued that focusing only on the final goods trade would be erroneous because a significant part of foreign trade comprises intermediate goods and inputs and "outsourcing" or "global product share". In outsourcing, the production process is divided into stages that facilitate easy transportation. Because the stages in outsourcing require different levels of skill intensity, the low-skilled-labor demand part of the product is directed to the low-skilled-labor-intensive countries. The rapid shift of production processes of intermediate inputs from developed to developing countries in the last 25 years has caused an increase in average skill intensity and the demand for skilled labor in both developing and developed countries (Robert C. Feenstra and Gordon H. Hanson 1996). In the case of intermediate goods and inputs trade, while trade openness reduces input prices, it may increase the demand for the production factor, which is complementary, and decrease the demand and thus the price of the substitute (Philippe Aghion and Jeffrey G. Williamson 1998).

Third, the direct link between goods prices and factor returns, as depicted in the HOSS framework, may not be valid. The HOSS theory predicts that in the process of adjustment to the trade reform labor will shift from the sectors with falling prices (contracting sectors) to the sectors with increasing prices (expanding sectors). However, in many developing countries, sectoral reallocation of labor may not materialize due mostly to internal factors such as rigid goods and labor markets and low labor mobility among domestic regions (Goldberg and Pavcnik 2007). Furthermore, prices and wages may change due to internal reasons unrelated to trade reform.

Fourth, exposure to international competition forces firms to increase production quality and to increase productivity, which in general requires high skilled labor, thereby increasing within-country wage dispersion.

Finally, high-technology transfers from developed to developing countries may increase the demand for skilled labor in developing countries counter to the pre-

dictions of the HOSS approach. FDIs can also increase the demand for skilled labor in both developed and developing countries because the technology brought to the host country by FDI tends to require more skilled labor. A broader capital account liberalization including international bank credits, portfolio investments, and trading in securities besides the increase in FDI has also effects in favor of skilled workers. If financial institutions are weak in host countries, international capital inflows may increase income inequality in favor of high-income groups and asset holders (International Monetary Fund 2007).

Relaxing the assumption of homogenous technology levels across countries in the HOSS framework and allowing for capital deepening and skill-biased technological change generally work counter to the distributional predictions of the HOSS theorem (for a review of the vast literature on these, see Meschi and Vivarelli 2009). A widely accepted view asserts that technical changes operate in favor of skilled labor, which increases the skill premium (Acemoğlu 2002). Imports, exports, and FDI can be seen as channels of technology adoption that shift the production function toward more skill-intensive technologies. For example, a recent study by Meschi, Erol Taymaz, and Vivarelli (2008), using firm-level data, found that trade openness generally led to an increase in demand for skilled labor; hence, the skill premium widened in Turkish firms providing support for the skill-biased technological change hypothesis (i.e. there is close complementarity between new technologies embodied in imports and exports and skill intensity).

Wage inequality may also increase due to changes in labor market institutions, deregulation of markets, and privatization of state-owned firms (Lee and Vivarelli 2006). For example, accompanied by the large-scale globalization and liberalization wave, unionization rates have declined significantly since the 1980s [especially in Organisation for Economic Co-operation and Development (OECD) countries; see Axel Dreher and Noel Gaston 2007]. The diminishing role of unions (or deunionization), decentralization of wage bargaining, and adoption of more elastic regulations in labor markets have all contributed to the widening of the gap between wages of skilled and unskilled labor. An efficient union system can prevent large increases in wage dispersion in two ways: (1) by providing necessary education to workers that enables them to adopt new technologies and (2) by negotiating minimum wages and industry wage premiums. Although it is not clear whether changes in labor market institutions emerge as a reaction to economic factors (such as large increases in unemployment in the 1970s) or as a result of globalization, in general, we can expect that in a country with a weak union system trade reforms and globalization can adversely affect wage inequality.

In addition to economic globalization in the form of trade and capital account liberalization, social and political globalization can also be significant for inequality (Dreher and Gaston 2008). Although one can devise several exemplary channels through which social and political integration increases or decreases inequality, this relationship is theoretically ambiguous. Countries generally compete to attract foreign investments (especially physical investments) by offering subsidies and lower taxes. As mentioned by Dreher and Gaston (2008), the cultural and social proximity to the host country and the relative ease of exchanging information may be signifi-

cant factors affecting the host country's decision to lower taxes. The host country is more likely to offer lower taxes to the source country if the two countries are more socially and politically integrated. Lower taxes may lead to lower social spending, implying a positive impact on inequality (Dreher and Gaston 2008). One can also devise a similar situation in which the host country is in a more advantageous situation in terms of social and political integration with the source country and thus may not have to offer subsidies and lower taxes to attract foreign investment. Political integration may confine competition among countries and lessen a potential "race to the bottom" induced by economic globalization, leading to higher taxes and higher social spending (Dreher 2005) and less inequality.

2. Related Empirical Literature

Cross-country empirical studies in the literature can be categorized based on the chosen measure of liberalization and/or globalization: (i) studies using narrower measures of globalization such as trade openness [generally defined as the sum of imports and exports to gross domestic product (GDP) ratio] and (ii) studies using composite globalization/liberalization indices. Because it is beyond the scope of this paper to provide a complete review of the extant literature on the first group of studies, we refer to Branko Milanovic (2005), Milanovic and Lyn Squire (2007) and also to Goldberg and Pavcnik (2007) on individual country studies. As summarized by Milanovic (2005, Table 1, p. 24) and Milanovic and Squire (2007, p. 145), cross-country studies using measures of openness and inequality generally produced inconsistent results. Although almost none of the studies surveyed by Milanovic (2005) found that openness reduces inequality, the general picture lacks a consensus. To be more specific, out of the fifteen papers surveyed by Milanovic and Squire (2007) six papers find a positive relationship, whereas five find no relationship between openness and inequality. Also, three papers point to a positive impact of openness on inequality in low-income countries. Only one paper finds a negative relationship between openness and inequality.

Table 1 gives a summary of more recent empirical studies (including the number of countries, sample period, measures or indices of globalization/liberalization, and inequality and empirical outcomes), focusing especially on the studies that employ a composite measure of globalization/liberalization. Using trade openness, FDI, and the strength of intellectual property rights as measures of globalization Samuel Adams (2008) found that globalization explains only 15% of the variance in income inequality. More specifically, using panel data with 5-year intervals for the 1985–2001 period, Adams (2008) provided evidence that strengthening intellectual property rights and openness are positively correlated with income inequality and that FDI is negatively and significantly correlated with income inequality. The results of this study also indicate that institutional infrastructure is negatively correlated with income inequality.

Evelyne Huber and John D. Stephens (2009) focused on income inequality in Latin America and the Caribbean where inequality tends to be very high compared to other regions in the world. They use trade openness, foreign capital inflows and the degree of IMF involvement as indicators of globalization. Their income inequality

data comes from WIID/SEDLAC database. Their results suggest that while a higher level of FDI inflow is found to be related to inequality, the capital market openness, the stock of FDI, and the presence of IMF are found to have insignificant effects on inequality.

Meschi and Vivarelli (2009) used disaggregated trade data as the measure of globalization and EHII from the University of Texas Inequality Project (UTIP) database as the measure of income inequality from 65 developing countries for the 1980–1999 period. Their results suggest that only trade with high-income countries worsens income distribution in developing countries. In contrast to the HOSS predictions, their findings support the hypothesis that technological differentials and the skill-biased nature of new technologies may be important factors in shaping the distributive effects of trade.

Using the KOF globalization index and UTIP-UNIDO wage and income inequality measures in several static and dynamic panel data models, Dreher and Gaston (2008) presented evidence that globalization increases both income and wage inequality. Their findings indicate that the positive association between globalization and inequality is especially strong for OECD countries. In fact, they noted that, referring to Bhagwati, "… it is the developed countries, rather than the developing countries, that oppose greater integration" (Dreher and Gaston 2008, p. 531). Their results also indicate that there is no support for the Kuznets hypothesis and democracy does not help reduce income and wage inequality.

The number of studies linking economic freedom to inequality is rather limited. Among the first studies Niclas Berggren (1999) and Gerald W. Scully (2002) found a negative relationship between the index of economic freedom and inequality using data from a sample of 26 developed countries and industrialized Asian countries. In stark contrast to these two studies, John R. Carter (2006) concluded that economic freedom increases income inequality. More recently, Andreas Bergh and Therese Nilsson (2010) examined the relationship between income inequality and globalization/liberalization using the Standardized World Income Inequality Database (SWIID) developed by Frederick Solt (2008) as the measure of income inequality, the KOF globalization index as the measure of globalization, and the Economic Freedom Index (EFI) as the measure of economic freedom and liberalization. Using a quinquennial panel data for the 1970–2005 period, their estimation results strongly indicate that freedom to trade internationally, deregulation, and social globalization have positive effects on income inequality.

More recently, Arne Bigsten and Farzana Munshi (2014) investigated how openness to trade and capital flows affect inter-occupational wage inequality in a panel of 15 OECD countries using the Occupational Wages around the World database. Their estimation results suggest that while openness to trade has a significant inequality increasing effect in poorer OECD countries, at higher levels of income, no significant effect has been found. They did not find any significant impact of openness to capital on occupational wage inequality either.

Using the KOF index of globalization and Theil's measure of inequality, Roberto Ezcurra and Andrés Rodriguez-Pose (2013) investigated the relationship between the variables in question in a panel of 47 developed and developing countries for the 1990–2007 period. Their study differs from other studies focusing on globali-

zation inequality nexus in that it includes regional inequality measure. The empirical results of Ezcurra and Rodriguez-Pose (2013) show a positive relationship between the degree of economic openness and the magnitude of within-country regional disparities; besides, the impact is greater in low- and middle-income countries.

Another paper examining the relationship in question belongs to Horácio C. Faustino and Carim Vali (2013). Using WIID and panel data analyses, this paper investigated the correlation between income inequality in OECD countries and economic globalization, measured by trade openness and FDI, for the 1995–2007 period. Whereas the fixed-effects results suggest a negative relationship between trade openness and inequality and a positive relationship between FDI and inequality, the generalized method of moments (GMM) results indicate a negative correlation between trade openness and inequality.

There are also several empirical studies using the A. T. Kearney and Foreign Policy Globalization Index (KGI) and principal components analysis (PCA) based on KGI. Among these, Almas Heshmati (2003), Marcel Neutel and Heshmati (2006), Heshmati and Sang-choon Lee (2010), and Lei Zhou et. al (2011) provided evidence that globalization decreases income inequality. These studies generally tend to cover about 60 countries over a limited period of time due to the unavailability of data.

Table 1 Summary of Recent Empirical Literature

Study	Countries	Period	Globalization/economic freedom measure	Inequality measure	Empirical findings
Bigsten and Munshi (2014)	15 OECD countries	1983-2003	Imports/GDP and FDI/GDP	OWW (by Richard B. Freeman and Remco H. Oostendorp 2000)	Trade openness increases wage inequality at lower levels of income. No significant effect at higher levels of income.
Ezcurra and Rodriguez-Pose (2013)	47 developed and developing countries	1990-2007	KOF	Theil's measure of inequality	Economic globalization increases regional inequality especially in low- and middle-income countries.
Faustino and Vali (2013)	OECD countries	1995-2007	Trade openness and FDI	GINI WIID v. 2	Trade openness reduces inequality, FDI increases inequality.
Zhou et al. (2011)	60 developed, transitional and developing countries	Early 2000s	Kearney globalization index	Gini WIID	Globalization decreases inequality.
Bergh and Nilsson (2010)	78/79 both developed and developing countries	1970-2005 5-year intervals	KOF EFI	SWIID from Solt (2008)	Social globalization, deregulation and freedom to trade increase inequality.
Heshmati and Lee (2010)	61 developed and developing countries	2001 cross-section	Kearney globalization index/PCA	Population weighted and mean GINI	Globalization decreases inequality.
Meschi and Vivarelli (2009)	65 developing countries	1980-1999 annual	Total trade flows from IMF' DOTS	UTIP EHII	Trade with high income countries worsen income distribution in developing countries.
Dreher and Gaston (2008)	100 OECD/ non-OECD countries	1970-2000 5-year intervals	KOF	UTIP Wage Inequality Theil index UTIP-EHII	Globalization increases income and wage inequality especially in OECD countries.
Adams (2008)	62 developing countries	1985-2001 5-year intervals	FDI, trade share in GDP intellectual property rights	GINI index from POVCAL database	Trade and intellectual property rights increase inequality; FDI decreases inequality.

Huber and Stephens (2009)	21 Latin American and Caribbean countries	1970-2000 annual	Capital market openness, trade openness and IMF presence	WIID/SEDLAC	Globalization measures are insignificant.
Carter (2006)	39 countries	1980-2000 5-year intervals	EFI	UNU-WIDER WIID v.2.0a	Economic freedom increases inequality.
Neutel and Heshmati (2006)	65 developing countries	1995-2001 annual-5-year	Kearney globalization index	Gini (Worldbank) Kuznets ratio	Globalization decreases inequality.
Milanovic (2005)	129 countries	1984-1998	Trade share in GDP, FDI	World Income Distribution (WYD) Database from Household Surveys	Greater trade increases income inequality.
Heshmati (2003)	62 countries	1995-2001	Kearney/PCA	Gini WIID	Personal contacts and technology reduces, economic integration increases inequality.
Scully (2002)	26 developed/ developing Asian countries	1975-1990 5-year intervals	EFI	Gini from Deininger-Squire dataset	Economic freedom reduces inequality.
Berggren (1999)	69-102 countries	1975-1985 5-year intervals	EFI	Gini from Deininger-Squire dataset and various income percentiles	Economic freedom reduces inequality.

Note: IIT = 1 – [(m – x)/(m + x)] where m = imports and x = exports; Kuznets ratio: the share of income owned by the poorest 20 percent of the population.

Source: Authors.

3. Econometric Models and Data

To examine the relationship between globalization/liberalization and wage inequality, we employed a standard cross-country panel data model in which both time-invariant country fixed-effects and country-invariant time effects are included. The model can be written as:

$$y_{it} = \alpha + \beta' G_{it} + \theta' X_{it} + \eta_i + \lambda_t + u_{it}, \quad (1)$$

where y_{it} is the natural logarithm of the wage inequality measure for country i in time period t, G_{it} is a measure of globalization (or economic freedom, $G_{it} = \{KOF_{it}, EFI_{it}\}$), X_{it} is a vector of control variables, η_i is country fixed-effect, λ_t is time fixed-effect, and u_{it} is idiosyncratic error term. The model presented in Equation (1) is essentially static. It can be argued that measures of inequality are likely to change slowly in time, necessitating the following dynamic specification:

$$y_{it} = \alpha + \rho y_{i,t-1} + \beta' G_{it} + \theta' X_{it} + \eta_i + \lambda_t + u_{it}. \quad (2)$$

The primary reason to add the lagged dependent variable is the possibility of high persistence in the inequality measure. The dynamic specification can also be used as a robustness check to the baseline specification by allowing the lagged dependent variable to be an explanatory variable. In addition to these arguments, the lagged inequality measure can also be viewed as a proxy for unobserved country effects. In this study we estimated both static and dynamic specifications to determine the sensitivity of the results together with several robustness checks.

We used 5-year averages of all dependent and explanatory variables for the 1970–2005 period. We calculated 5-year averages as follows: annual observations for the 1966–1970 period were averaged and taken as the observed value for 1970; similarly, a 5-year average for the 1971–1975 period was recorded as the observation

for 1975 and so on. Because the data set contains few observations after 2005, we used only averages for the 2001–2005 period. This gives us eight time periods.

We obtained our wage inequality data from the UTIP, which is based on industrial earnings data compiled by the United Nations Industrial Development Organization (UNIDO). The UTIP-UNIDO data set uses a three-digit International Standard Industrial Classification (ISIC) scheme from manufacturing industry and it measures pay inequality between industrial sectors within each country using the Theil's *T* inequality statistic (Hyunsub Kum 2008). More specifically, our measure of wage inequality within a country is given by the between-groups component of Theil's statistic:

$$T = T_B + T_W, \tag{3}$$

where T_B is the between-group component and T_W is the within-group component which is not observable. The between-group component is the lower bound on the overall industrial pay inequality (Kum 2008). Given the data on total payroll and employment in manufacturing sectors T_B can be calculated using the following formula:

$$T_B = \sum_{j=1}^{K} \frac{w_j}{W} \ln\left(\frac{w_j/W}{N_j/N}\right), \tag{4}$$

where j represents groups (categories within the UNIDO industrial classification codes); W and N represent total pay and total employment, respectively; $\frac{w_j}{W}$ and $\frac{N_j}{N}$ measure group j's share of total pay and employment, respectively.

The Theil earnings inequality index has been used by James K. Galbraith and Kum (2003) to examine the relationship between economic growth and inequality. They argued that, compared to the widely used Deininger-Squire data set, the UTIP pay inequality data set is more consistent and less prone to measurement errors and data problems. Focusing on inequality in manufacturing pay is motivated by the following factors: (i) because wage is a significant component of overall income, patterns in wage inequality will be reflected in income inequality; (ii) manufacturing pay inequality is likely to be related to the broader inequality of all forms of pay including agricultural pay; (iii) the behavior of industrial wage inequality may be the driving force behind the evolution of inequality; (iv) the evolution of inequality may have an inter-industrial nature such that changes in technology may create a wedge between the earnings of skilled workers in advanced industries and unskilled workers in backward industries, and in such circumstances, industrial pay inequality may be a better measure to focus (Galbraith and Kum 2003, pp. 530-532). The 5-year industrial pay inequality index data set contains 793 observations over 154 countries. The summary statistics are given in Table A1 in the Appendix.

As a proxy variable for the degree of globalization phenomenon, G_{it}, we used the KOF index developed by Dreher (2006), which measures the overall as well as economic, political, and social dimensions of globalization. The economic integration index, KOF A, is calculated using data on actual trade, foreign direct and portfolio investment flows, and restrictions on international trade. The social globalization subindex, KOF B, is calculated using data on personal contact, information flows,

and cultural proximity. The political globalization subindex, KOF C, is based on the number of embassies and high commissions, the number of international organizations, and the number of participated UN peace missions (details are available upon request in a separate appendix).

We used the Economic Freedom of the World index (EFI) and its subcomponents developed by the Fraser Institute (James Gwartney, Robert Lawson, and Seth Norton 2008) as a proxy for the degree of economic freedom/liberalization. EFI consists of five dimensions: EFI 1 measures the extent to which countries rely on individual choice and markets rather than the political process to allocate resources and goods and services (Gwartney and Lawson 2003). EFI 2 measures the quality of legal system and security of property rights. EFI 3 quantifies the access to sound money and future price uncertainty by taking into account the annual inflation rate and its standard deviation. The EFI 4 component quantifies the freedom of trade using data on trade taxes, trade barriers, tariffs, and other barriers to trade and capital mobility. Based on this definition, the EFI 4 subcomponent is closely related to the KOF A subindex. EFI 5 measures the degree of economic freedom in credit, labor, and goods and services markets. Less regulation implies a higher EFI 5 score (details are available upon request in a separate appendix).

The vector of control variables, X_{it}, include several country-specific characteristics that may affect inequality. We included the natural logarithm of GDP *per capita* (in 2000 USD, denoted *Log GDP*) and its square (*Log GDP squared*) to capture Kuznets-type effects of the level of development on inequality. To control differences in the quality of human capital over countries, we included the share of population above 25 years old with higher education (*education*). We included age dependency ratio defined as the share of population younger than 15 years old and older than 64 years to capture demographic differences over countries (*dependency*). We included a democracy index to control for the level of institutionalized democracy in a country (*democracy*). The chosen democracy index is obtained from the Polity IV project (Monty G. Marshall, Keith Jaggers, and Tedd R. Gurr 2010) and it is defined on an 11-point scale of 0 to 10, with 10 being the highest level of institutionalized democracy. We also included the share of the industry's value added in GDP in our models (*industry share*) to capture the level of industrialization in a country (Table A3 in the Appendix provides detailed explanations and sources of the data).

4. Estimation Results

Our empirical results are organized as follows. We first present our baseline estimation results from the static panel data model [Equation (1)] for the full sample in Table 2. We estimated ten models in which KOF and EFI composite indices and their subcomponents are included separately. All formulations include time dummies. In the following tables, we also present information on the number of countries covered in each model, the number of observations, within R-squares, and p-values for the joint significance of time effects. Heteroscedasticity-robust standard errors are provided in parentheses under coefficient estimates. Depending on the measures of globalization and economic freedom, the number of countries included in the full sample ranges from 86 to 99 (see Table A2 in Appendix for the list of countries). Time and country effects are all statistically significant at conventional levels in all

formulations. Following the baseline results, we present and discuss dynamic GMM estimation results and provide several sensitivity tests.

Table 2 Static Fixed-Effects Estimation Results: All Countries

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Log GDP	0.234	0.247	0.202	-0.005	-0.075	-0.042	-0.070	0.305	-0.227	-0.757
	(0.878)	(0.885)	(0.882)	(0.908)	(0.904)	(0.884)	(0.932)	(0.892)	(0.928)	(0.880)
Log GDP2	-0.045	-0.044	-0.035	-0.027	-0.027	-0.022	-0.025	-0.043	-0.016	0.013
	(0.057)	(0.057)	(0.059)	(0.059)	(0.058)	(0.057)	(0.060)	(0.057)	(0.060)	(0.058)
Education	0.023	0.023	0.023	0.029*	0.024	0.023	0.026	0.026	0.023	0.018
	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.017)	(0.016)	(0.016)	(0.017)
Dependency	0.012**	0.010*	0.011**	0.013**	0.004	0.010*	0.006	0.010*	0.008	0.005
	(0.005)	(0.006)	(0.005)	(0.005)	(0.005)	(0.005)	(0.006)	(0.005)	(0.006)	(0.006)
Democracy	0.025*	0.027*	0.028**	0.026*	0.023	0.027*	0.025	0.025	0.015	0.020
	(0.014)	(0.015)	(0.014)	(0.015)	(0.016)	(0.015)	(0.016)	(0.015)	(0.016)	(0.016)
Industry share	0.004	0.002	-0.000	0.003	-0.003	0.002	0.001	0.000	0.004	0.001
	(0.011)	(0.011)	(0.011)	(0.011)	(0.012)	(0.011)	(0.011)	(0.011)	(0.011)	(0.010)
KOF	0.008									
	(0.010)									
KOF A		0.005								
		(0.008)								
KOF B			-0.006							
			(0.007)							
KOF C				0.008**						
				(0.004)						
EFI					0.056					
					(0.054)					
EFI 1						0.067*				
						(0.037)				
EFI 2							0.012			
							(0.027)			
EFI 3								-0.024		
								(0.017)		
EFI 4									0.104**	
									(0.040)	
EFI 5										0.194**
										(0.074)
Constant	-4.096	-3.997	-3.751	-3.572	-2.029	-3.209	-2.132	-4.044	-2.201	-0.034
	(3.441)	(3.473)	(3.421)	(3.391)	(3.448)	(3.439)	(3.766)	(3.518)	(3.640)	(3.283)
Countries #	99	97	99	99	91	90	88	90	86	90
N	510	500	510	510	456	480	437	483	450	441
R^2	0.239	0.233	0.239	0.252	0.238	0.242	0.240	0.234	0.268	0.281
F-Time	0.003	0.009	0.000	0.000	0.008	0.005	0.000	0.000	0.004	0.028
F-Country	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Note: Dependent variable is natural log of UTIP IPI. Robust Standard Errors, shown in parentheses underneath the parameter estimates, were computed using Huber-White sandwich estimator. F-Time and F-Country are the *p*-values from the *F*-test of time effects and country effects, respectively. Significance levels for asterisks: *10%; **5%; ***1%.

Source: Authors.

4.1 Baseline Static Fixed-Effects Estimation Results

Table 2 summarizes our baseline results from the static model for the industrial earnings inequality. The results indicate that the Kuznets-type relationship does not hold between wage inequality and the level of development. Education is insignificant in all models, except the one including the KOF C subcomponent at the 10% level (column 4). The age dependency ratio is generally significant and positively related to wage inequality. The democracy index is significant at the 5% or 10% level in models with KOF and its subcomponents and also EFI 1. The industry's share in the economy does not matter for the distribution of earnings within a country. Interestingly, the overall KOF index and its subcomponents KOF A and KOF B are insignificant, whereas the KOF C subcomponent, political globalization index, has a positive and significant (at the 5% level) coefficient estimate. A one-point increase in the political globalization index leads to about 0.8% increase in wage inequality. The coefficient estimates on EFI 1, EFI 4, and EFI 5 are all positive and significant at the 10% and 5% levels, respectively. These results imply that smaller government and more deregulated markets are associated with more unequal wage distribution. An increase in freedom to trade, quantified by the EFI 4 subindex, has a positive effect on wage inequality.

4.2 Dynamic GMM Results

Table 3 summarizes the dynamic system GMM estimation results for the wage inequality. Because the inclusion of lagged dependent variable creates an endogeneity problem, which cannot be cured by traditional methods of removing country fixed-effects, the fixed-effects estimator is biased and inconsistent in small T large N panels. Instead, we employed the dynamic system GMM estimator developed by Manuel Arellano and Stephen Bond (1991) and Richard Blundell and Bond (1998). We used xtabond2 STATA routine written by David Roodman (2006) with small sample correction suggested by Frank Windmeijer (2005). To minimize the number of observations lost, we used forward orthogonal deviations as suggested by Arellano and Olympia Bover (1995) instead of first differencing. We also reported the AR(2) test of Arellano and Bond (1991) and the Hansen test for the validity of instruments and moment conditions. The Hansen test indicates that the null hypothesis that moment conditions are correctly specified cannot be rejected. Together with the AR(2) test, we can conclude that moment conditions are valid and models do not have a serial correlation problem. We used two lags GMM-style (internal) instruments (see Roodman 2006) in our system GMM estimation resulting in 24 instruments. We have also considered GMM-style instruments in which explanatory variables are treated as endogenous. In this case, the number of instruments exceeds the number of countries, but the results are qualitatively similar.

The results in Table 3 indicate that the lagged wage inequality index is statistically significant at the 1% level in all models with parameter estimates ranging from 0.717 to 0.809. This result reflects the highly persistent nature of within-country wage inequality. As can be seen in Table 3, none of the control variables, except education and squared *per capita* income, is significant. The overall globalization index

Table 3 Dynamic System GMM Estimation Results: All Countries

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Lagged log IPI	0.807***	0.797***	0.807***	0.809***	0.782***	0.797***	0.752***	0.779***	0.717***	0.779***
	(0.078)	(0.086)	(0.080)	(0.079)	(0.088)	(0.105)	(0.072)	(0.076)	(0.086)	(0.096)
Log GDP	0.271	0.278	0.258	0.267	0.245	0.253	0.334*	0.242	0.275	0.273
	(0.186)	(0.183)	(0.177)	(0.178)	(0.175)	(0.179)	(0.197)	(0.182)	(0.195)	(0.194)
Log GDP2	-0.023*	-0.024*	-0.021*	-0.023*	-0.022*	-0.022*	-0.031**	-0.020*	-0.027**	-0.025*
	(0.013)	(0.013)	(0.012)	(0.012)	(0.012)	(0.011)	(0.013)	(0.012)	(0.013)	(0.013)
Education	0.008*	0.008*	0.008**	0.008*	0.008*	0.005	0.008*	0.007*	0.007*	0.008
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.005)
Dependency	0.002	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.002	0.001
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Democracy	0.009	0.009	0.008	0.008	0.006	0.010	0.005	0.008	0.007	0.007
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.006)	(0.007)	(0.007)	(0.007)
Industry share	-0.002	-0.002	-0.003	-0.002	-0.002	-0.003	-0.002	-0.005	-0.003	-0.001
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.003)
KOF	0.001									
	(0.003)									
KOF A		0.002								
		(0.002)								
KOF B			-0.001							
			(0.002)							
KOF C				0.000						
				(0.001)						
EFI					-0.000					
					(0.042)					
EFI 1						0.007				
						(0.026)				
EFI 2							0.030*			
							(0.017)			
EFI 3								-0.036***		
								(0.011)		
EFI 4									0.029	
									(0.027)	
EFI 5										0.014
										(0.033)
Constant	-1.385*	-1.450*	-1.277*	-1.357*	-1.190	-1.205*	-1.602**	-0.898	-1.529*	-1.339
	(0.780)	(0.767)	(0.713)	(0.730)	(0.821)	(0.718)	(0.771)	(0.748)	(0.825)	(0.895)
Countries #	95	93	95	95	89	88	86	88	84	88
N	425	417	425	425	398	405	381	407	391	390
# of instruments	24	24	24	24	24	24	24	24	24	24
AR(2) test (pval)	0.445	0.561	0.454	0.446	0.515	0.529	0.613	0.444	0.478	0.495
Hansen test (pval)	0.760	0.773	0.739	0.758	0.775	0.657	0.710	0.632	0.612	0.624

Note: Dependent variable is natural log of UTIP IPI. Standard errors are in parentheses. Significance levels: *10%; **5%; ***1%.

Source: Authors.

and its subcomponents are all insignificant. As for the freedom index, only EFI 2 and EFI 3 have statistically significant effects on wage inequality. The quality of legal system has a significant positive effect on wage inequality (although only at the 10% significance level). The subcomponent EFI 3, access to sound money, has a negative coefficient estimate, which is significant at the 1% level. A higher value for EFI 3, a less uncertain and more stable price system in an economy, implies a more equal wage distribution.

The dynamic system GMM estimation results imply that wage inequality has a significant and slowly changing component. In this regard, it can be argued that static formulations may be misspecified and inconsistent. Following this line of argument, it can be inferred that the preferred formulation for the wage inequality-globalization nexus should be the one including the lagged inequality measure in the explanatory variable set. Therefore, we proceed with carrying out further analysis using the dynamic framework.

Country Groups

The dynamic GMM estimation results over country groups are summarized in Table 4. We considered four country groups: emerging markets (EM), OECD, non-OECD, and European Union (EU) countries. Similar to baseline dynamic results (given in the first column of Table 4 for easy comparison), overall KOF and all of its subcomponents are statistically insignificant for all country groups. Consistent with the static results, overall EFI and its subcomponent EFI 2 (quality of legal system) have a positive and significant impact on wage inequality in OECD countries. Access to sound money (EFI 3) decreases wage inequality in EM, non-OECD, and EU countries. This result implies that a more stable price system is robustly associated with less wage inequality, which is in line with the current literature on the impact of inflation on inequality that predicts a positive relationship (e.g. see Raj M. Desai, Anders Olofsgard, and Tarık M. Yousef 2005; Stefania Albanesi 2007). Regarding the impact of regulation of credit markets, labor markets, and business in general, we found that the EFI 5 subcomponent has a positive impact on wage inequality in OECD countries (significant at the 5% level), implying that more deregulation is associated with more wage inequality. This result is consistent with the findings of Nicole M. Fortin and Thomas Lemieux (1997) which provided evidence that the changing labor market institutions (i.e. decline in the purchasing power of minimum wage, deunionization, and economic deregulation) are generally responsible for the increase in wage inequality in the United States.

Table 4 Dynamic GMM Estimation Results over Country Groups

	All	Emerging markets	OECD	Non-OECD	EU
KOF	0.001	0.004	0.001	0.004	-0.006
	(0.003)	(0.004)	(0.010)	(0.006)	(0.006)
KOF A	0.002	0.004	0.002	0.002	-0.000
	(0.002)	(0.004)	(0.009)	(0.003)	(0.004)
KOF B	-0.001	0.001	-0.004	-0.002	-0.005
	(0.002)	(0.003)	(0.006)	(0.004)	(0.006)

KOF C	0.000	-0.000	0.008	0.002	-0.004
	(0.001)	(0.003)	(0.008)	(0.002)	(0.003)
EFI	-0.000	0.064	0.133*	-0.056	0.077
	(0.042)	(0.066)	(0.077)	(0.048)	(0.084)
EFI 1	0.007	0.058	0.020	-0.022	0.148
	(0.026)	(0.053)	(0.072)	(0.020)	(0.104)
EFI 2	0.030*	-0.007	0.056**	0.030	0.045
	(0.017)	(0.027)	(0.027)	(0.024)	(0.039)
EFI 3	-0.036***	-0.024*	0.007	-0.045***	-0.050**
	(0.011)	(0.013)	(0.027)	(0.015)	(0.024)
EFI 4	0.029	0.061	0.053	0.020	0.127
	(0.027)	(0.036)	(0.044)	(0.040)	(0.079)
EFI 5	0.014	0.035	0.160**	-0.017	0.028
	(0.033)	(0.050)	(0.065)	(0.057)	(0.058)
Countries #	84-95	27-28	27	55-66	22
N	381-425	130-134	125-128	227-268	91-95
# of instruments	24	24	18	24	16

Note: All results are from dynamic system GMM estimation except OECD countries for which we employed difference-GMM estimation strategy due to significant AR(2) test obtained from system GMM estimation.

Source: Authors.

Subcomponents Together

For each country group (EM, OECD, non-OECD, and EU), we also estimated the dynamic model including composite indices together to see the ceteris paribus impacts (we did not present results from the model including all subcomponents together to save space, but detailed tables are available upon request). None of the subcomponents of the KOF index is significant regardless of country groups. As also argued by Dreher and Gaston (2008) in the context of KOF subindices, it becomes difficult to disentangle their individual impacts due to high correlations among the five EFI subcomponents. However, there is some indication that, similar to previous results, a stable price system in EM and non-OECD countries helps reduce wage inequality. Only EFI 2 significantly and positively affects wage inequality in OECD and EU countries.

4.3 Further Robustness Tests

We carried out three sets of further robustness tests and summarize the results in Table A4 in the Appendix. First, we changed the functional form and experiment with quadratic, logarithmic, and lagged specifications for composite indices. Adding squares of KOF and EFI and all their subcomponents renders all coefficients insignificant, implying that quadratic specification is not appropriate. Next, we included logarithms of indices instead of levels in the model. Using logarithmic indices instead of levels does not change the baseline results. EFI 2 has a positive coefficient, EFI 3 has a negative coefficient, and both of them are significant. Finally, we modified the baseline dynamic model by adding lagged values of composite indices and excluding current values. Using lagged indices, we see that none of the coefficients is significant, indicating that using current 5-year averages is more appropriate.

Second, we experimented with alternative measures for some of the control variables. We replaced the age dependency ratio with population growth as a proxy for demographic factors. The results are virtually the same with the baseline model. Using years of schooling as a measure for educational attainment also renders the baseline qualitative results unaltered.

Third, we left out certain countries based on their geographical location (Eastern Asia and Pacific, Latin America, MENA and Sub-Saharan Africa, South Asia, Western Europe and North America, and Eastern Europe and Post-Soviet republics). The baseline results are, in general, robust to excluding groups of countries based on geographical location. EFI 2 is positively and EFI 3 is negatively associated with wage inequality as in the results for all countries. The empirical results are only sensitive to excluding countries in MENA and Sub-Saharan Africa in which none of the composite indices is significant.

5. Conclusion

This paper is an attempt to understand the impact of globalization and liberalization on within-country wage inequality for the 1970–2005 period. Owing to the multifaceted nature of globalization and its controversial relationship with liberalization, in this paper, we used two widely known composite indices to gauge their impacts on wage inequality empirically. We presented results from both static fixed-effects and dynamic system GMM estimations and conducted several robustness checks. The static panel data estimation results imply that wage inequality increases with political globalization, smaller government, and more deregulation. The dynamic system GMM estimation results indicate a strongly persistent component in the wage inequality index. Although the overall EFI and its subcomponent measuring the degree of economic freedom to international trade are found to be insignificant, there is some indication that more economic freedom is associated with more wage inequality in some country groups. Overall EFI and its subcomponents measuring the legal structure and the degree of deregulation are associated with more earnings inequality in OECD countries. This result is compatible with the view that market-oriented policies (e.g. deunionization and deregulation) tend to increase earnings inequality in more developed countries. Another interesting result is that a more stable price system implies less wage inequality in EM, non-OECD, and EU countries. These results suggest that less developed countries should pursue policies to attain a more sound money and a stable price system to decrease within-country earnings inequality.

References

Acemoğlu, Daron. 2002. "Technical Change, Inequality and the Labor Market." *Journal of Economic Literature*, 40(1): 7-72.

Adams, Samuel. 2008. "Globalization and Income Inequality: Implications for Intellectual Property Rights." *Journal of Policy Modeling*, 30(5): 725-735.

Aghion, Philippe, and Jeffrey G. Williamson. 1998. *Growth, Inequality and Globalization: Theory, History and Policy*. Cambridge, UK: Cambridge University Press.

Aisbett, Emma. 2003. "Globalization, Poverty and Inequality: Are the Criticisms Vague, Vestet or Valid?" Paper prepared for the NBER Pre-Conference on Globalization, Poverty and Inequality, University of California at Berkeley, Berkeley, CA.

Aisbett, Emma. 2004. "Why Are the Critics so Convinced that Globalization Is Bad for the Poor?" National Bureau of Economic Research Working Paper 11066.

Aisbett, Emma. 2007. "Why Are the Critics so Convinced that Globalization Is Bad for the Poor?" In *Globalization and Poverty*, ed. Ann Harrison, 33-75. Chicago: University of Chicago Press.

Albanesi, Stefania. 2007. "Inflation and Inequality." *Journal of Monetary Economics*, 54(4): 1088-1114.

Arellano, Manuel, and Stephen Bond. 1991. "Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations." *Review of Economic Studies*, 58(2): 277-297.

Arellano, Manuel, and Olympia Bover. 1995. "Another Look at the Instrumental Variable Estimation of Error-Components Models." *Journal of Econometrics*, 68(1): 29-51.

Barro, Robert J., and Jong-Wha Lee. 2010. "A New Data Set of Educational Attainment in the World, 1950-2010." National Bureau of Economic Research Working Paper 15902.

Berggren, Niclas. 1999. "Economic Freedom and Inequality: Friends or Foes?" *Public Choice*, 100(3-4): 203-223.

Bergh, Andreas, and Therese Nilsson. 2010. "Do Liberalization and Globalization Increase Income Inequality?" *European Journal of Political Economy*, 26(4): 488-505.

Bigsten, Arne, and Farzana Munshi. 2014. "Globalisation and Inter-Occupational Inequality: Empirical Evidence from OECD Countries." *The World Economy*, 37(3): 501-510.

Blundell, Richard, and Stephen Bond. 1998. "Initial Conditions and Moment Restrictions in Dynamic Panel Data Models." *Journal of Econometrics*, 87(1): 115-143.

Carter, John R. 2006. "An Empirical Note on Economic Freedom and Income Inequality." *Public Choice*, 130(1-2): 163-177.

Desai, Raj M., Anders Olofsgard, and Tarık M. Yousef. 2005. "Inflation and Inequality: Does Political Structure Matter?" *Economics Letters*, 87(1): 41-46.

Dreher, Axel. 2005. "The Influence of Globalization on Taxes and Social Policy: An Empirical Analysis for OECD Countries." *European Journal of Political Economy*, 22(1): 179-201.

Dreher, Axel. 2006. "Does Globalization Affect Growth? Evidence from a New Index of Globalization." *Applied Economics*, 38(10): 1091-1110.

Dreher, Axel, and Noel Gaston. 2007. "Has Globalization Really Had No Effect on Unions?" *Kyklos*, 60(2): 165-186.

Dreher, Axel, and Noel Gaston. 2008. "Has Globalization Increased Inequality?" *Review of International Economics*, 16(3): 516-536.

Ezcurra, Roberto, and Andrés Rodriguez-Pose. 2013. "Does Economic Globalization Affect Regional Inequality? A Cross-Country Analysis." *World Development*, 52: 92-103.

Faustino, Horácio C., and Carim Vali. 2013. "The Effects of Globalization and Economic Growth on Income Inequality: Evidence for 24 OECD Countries." *Argumenta Oeconomica*, 1(30): 13-31.

Feenstra, Robert C., and Gordon H. Hanson. 1996. "Globalization, Outsourcing and Wage Inequality." *American Economic Review*, 86(2): 240-245.

Fortin, Nicole M., and Thomas Lemieux. 1997. "Institutional Change and Rising Wage Inequality: Is There a Linkage?" *Journal of Economic Perspectives*, 11(2): 75-96.

Freeman, Richard B., and Remco H. Oostendorp. 2000. "Wages around the World: Pay across Occupations and Countries." National Bureau of Economic Research Working Paper 8058.

Galbraith, James K., and Hyunsub Kum. 2003. "Inequality and Economic Growth: A Global View Based on Measures of Pay." *CESifo Economic Studies*, 49(4): 527-556.

Goldberg, Pinelopi K., and Nina Pavcnik. 2007. "Distributional Effects of Globalization in Developing Countries." *Journal of Economic Literature*, 45(1): 39-82.

Gwartney, James, and Robert Lawson. 2003. "The Concept and Measurement of Economic Freedom." *European Journal of Political Economy*, 19(3): 405-430.

Gwartney, James, Robert Lawson, and Seth Norton. 2008. *Economic Freedom of the World: 2008 Annual Report*. Vancouver, BC: The Fraser Institute.

Heshmati, Almas. 2003. "Measurement of a Multidimensional Index of Globalization and Its Impact on Income Inequality." United Nations University, World Institute for Development Economics Research Discussion Paper 2003/69.

Heshmati, Almas, and Sang-choon Lee. 2010. "The Relationship between Globalization, Economic Growth and Income Inequality." *Journal of Globalization Studies*, 1(2): 87-117.

Huber, Evelyne, and John D. Stephens. 2008. "Globalization and Inequality in Latin America and the Caribbean." In *Challenges of Globalization: Immigration, Social Welfare, Global Governance*, ed. Andrew C. Sobel, 127-153. New York: Routledge.

International Monetary Fund. 2007. *Globalization and Inequality, World Economic Outlook, October*. Washington: International Monetary Fund.

Kremer, Michael, and Eric Maskin. 2006. "Globalization and Inequality." Weatherhead Center for International Affairs Working Paper 2008-0087.

Kum, Hyunsub. 2008. "Inequality and Structural Change." University of Texas Inequality Project Working Paper 54.

Lee, Eddy, and Marco Vivarelli. 2006. "The Social Impact of Globalization in the Developing Countries." *International Labor Review*, 145(3): 167-184.

Marshall, Monty G., Keith Jaggers, and Tedd R. Gurr. 2010. Polity IV Project: Political Regime Characteristics and Transitions 1800-2010. Data and Codebook. www.systemicpeace.org/inscr/inscr.htm (accessed July 13, 2012).

Meschi, Elena, and Marco Vivarelli. 2009. "Trade and Income Inequality in Developing Countries." *World Development*, 37(2): 287-302.

Meschi, Elena, Erol Taymaz, and Marco Vivarelli. 2008. "Trade Openness and Demand for Skills: Evidence from Turkish Microdata." Institute for the Study of Labor Discussion Paper 3887.

Milanovic, Branko. 2005. "Can We Discern the Effect of Globalization on Income Distribution? Evidence from Household Surveys." *World Bank Economic Review*, 19(1): 21-44.

Milanovic, Branko, and Lyn Squire. 2007. "Does Tariff Liberalization Increase Wage Inequality? Some Empirical Evidence." In *Globalization and Poverty*, ed. Ann Harrison, 143-179. Chicago: University of Chicago Press.

Neutel, Marcel, and Almas Heshmati. 2006. "Globalisation, Inequality and Poverty Relationships: A Cross Country Evidence." Institute for the Study of Labor Discussion Paper 2223.

Roodman, David. 2006. "How to Do xtabond2: An Introduction to 'Difference' and 'System' GMM in Stata." Center for Global Development Working Paper 103.

Scully, Gerald W. 2002. "Economic Freedom, Government Policy and the Trade-Off between Equity and Economic Growth." *Public Choice*, 113(1-2): 77-96.

Solt, Frederick. 2008. "Standardizing the World Income Inequality Database." *Social Science Quarterly*, 90(2): 231-242.

Windmeijer, Frank. 2005. "A Finite Sample Correction for the Variance of Linear Efficient Two-Step GMM Estimators." *Journal of Econometrics*, 126(1): 25-51.

Zhou, Lei, Basudeb Biswas, Tyler Bowles, and Peter J. Saunders. 2011. "Impact of Globalization on Income Distribution Inequality in 60 Countries." *Global Economy Journal*, 11(1): 1-18.

Appendix

Table A1 Summary Statistics of Industrial Wage Inequality Index over Country Groups

Country grouping	Obs	Number of countries	Average time periods	Mean	SD	Min	Max
All	793	154	5.15	0.056	0.057	0.001	0.485
Emerging markets	179	29	6.17	0.042	0.028	0.002	0.128
OECD	211	32	6.59	0.023	0.017	0.003	0.109
Non-OECD	582	122	4.77	0.067	0.062	0.001	0.485
European Union	138	24	5.75	0.019	0.015	0.003	0.109
Western Europe and North America	157	23	6.83	0.019	0.014	0.003	0.109
East Asia and Pacific	45	9	5	0.054	0.077	0.002	0.485
Eastern Europe and Post-Soviet Republics	93	24	3.88	0.036	0.049	0.001	0.254
South Asia	77	13	5.92	0.061	0.027	0.013	0.119
Middle East and North Africa	100	19	5.26	0.086	0.098	0.006	0.416
Sub-Saharan Africa	185	39	4.74	0.073	0.047	0.005	0.321
Latin America and the Caribbean	135	27	5	0.063	0.043	0.003	0.259

Source: Authors.

Table A2 List of Countries

Albania	Cote D'ivore	Iran	Mozambique	Slovenia OECD, EU
Algeria	Croatia	Ireland OECD, EU	Nepal LDC	South Africa EM
Argentina EM	Czech Rep. OECD, EU, EM	Italy OECD, EU	NetherlandsOECD, EU	Spain OECD, EU, EM
Armenia	Denmark OECD	Jamaica	New Zealand OECD, EM	Sri Lanka
Australia OECD	Dominican Republic	Japan OECD	Norway OECD	Sudan
Austria OECD, EU	Egypt EM	Jordan	Pakistan EM	Sweden OECD, EU
Bangladesh	El Salvador	Kenya	Panama	Syria
Belgium OECD, EU	Fiji	Korea OECD, EM	Papua New Guinea	Thailand EM
Benin	Finland OECD, EU	Kyrgyzstan	Paraguay	Trinidad and Tobago
Bolivia	France OECD, EU	Latvia EU	Peru EM	Tunisia
Botswana	Gabon	Lesotho	Philippines EM	Turkey OECD, EM
Brazil EM	Gambia	Lithuania EU	Poland OECD, EU, EM	Uganda
Bulgaria EU, EM	Germany OECD, EU	Malawi	Portugal OECD, EU, EM	Ukraine
Cameroon	Ghana	Malaysia EM	Romania OECD, EU, EM	U.K. OECD, EU
Canada OECD	Greece OECD, EU, EM	Mauritania	Russia EM	United States OECD
Central African Republic	Guatemala	Mauritius	Rwanda	Uruguay
Chile OECD, EM	Honduras	Mexico OECD, EM	Senegal	Venezuela
China EM	Hungary OECD, EU, EM	Moldova	Sierra Leone	Zambia
Colombia	India EM	Mongolia	Singapore EM	Zimbabwe
Costa Rica	Indonesia EM	Morocco	Slovakia OECD, EU, EM	

Source: Authors.

Table A3 Description and Sources of Data

Variable	Description	Source
Industrial payments inequality	Between group component of Theil's statistic	University of Texas Inequality Project (UTIP) based on United Nations Industrial Development Organization (UNIDO) industry statistics http://utip.gov.utexas.edu/
Globalization Index (KOF) and subcomponents		Dreher (2006) http://globalization.kof.ethz.ch/
Economic Freedom Index (EFI) and subcomponents		Gwartney, Lawson, and Norton (2008) www.freetheworld.com/
GDP (*per capita*)	Measured in constant US$	World Bank World Development Indicators
GDP (*per capita*) squared		World Bank World Development Indicators
Education	Share of population over 25 years of age with higher education	Robert J. Barro and Jong-Wha Lee (2010) www.barrolee.com/

Dependency	Age-dependency ratio is defined as the share of population under 15 and over 64 years of age	World Bank World Development Indicators
Democracy	Measures the level of institutionalized democracy over 0-10	Marshall, Jaggers, and Gurr (2010) www.systemicpeace.org/inscr/inscr.htm
Industry	Share of industry's value added in GDP	World Bank World Development Indicators

Source: Authors.

Table A4 Summary of Robustness Checks: Wage Inequality Dynamic System GMM

	Gt: Globalization indices and subcomponents (included separately)									
	KOF	**KOF A**	**KOF B**	**KOF C**	**EFI**	**EFI 1**	**EFI 2**	**EFI 3**	**EFI 4**	**EFI 5**
Baseline (all countries)	0.001 (0.003)	0.002 (0.002)	-0.001 (0.002)	0.000 (0.001)	-0.000 (0.042)	0.007 (0.026)	0.030* (0.017)	-0.036*** (0.011)	0.029 (0.027)	0.014 (0.033)
Quadratic specification (level)	0.008 (0.009)	0.008 (0.007)	-0.004 (0.005)	0.003 (0.006)	-0.023 (0.201)	0.140 (0.098)	0.089 (0.059)	-0.051 (0.046)	0.129 (0.103)	0.105 (0.186)
Quadratic specification (square)	-0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)	0.002 (0.016)	-0.012 (0.008)	-0.005 (0.005)	0.001 (0.004)	-0.009 (0.008)	-0.008 (0.015)
Logarithmic specification	0.076 (0.130)	0.107 (0.102)	-0.081 (0.069)	0.028 (0.066)	-0.011 (0.232)	0.069 (0.130)	0.146* (0.085)	-0.090** (0.043)	0.184 (0.149)	0.108 (0.200)
Lagged indices G_{t-1}	-0.002 (0.003)	-0.000 (0.002)	-0.001 (0.002)	-0.001 (0.001)	0.005 (0.032)	-0.005 (0.024)	0.021 (0.019)	-0.010 (0.009)	0.002 (0.021)	-0.011 (0.031)
Including population growth	0.001 (0.003)	0.002 (0.002)	-0.001 (0.003)	0.001 (0.001)	0.014 (0.040)	0.014 (0.025)	0.029* (0.017)	-0.031*** (0.010)	0.033 (0.028)	0.024 (0.032)
Including years of schooling	0.001 (0.003)	0.001 (0.002)	-0.001 (0.002)	0.000 (0.001)	-0.010 (0.043)	0.007 (0.025)	0.029* (0.017)	-0.038*** (0.011)	0.026 (0.027)	0.005 (0.041)
Excluding Eastern Asia and Pacific	0.003 (0.002)	0.002 (0.002)	0.001 (0.002)	0.001 (0.001)	-0.000 (0.042)	0.008 (0.023)	0.035** (0.015)	-0.034*** (0.011)	0.033 (0.028)	0.012 (0.032)
Excluding Latin America	0.000 (0.004)	0.002 (0.003)	-0.001 (0.003)	-0.001 (0.002)	0.011 (0.047)	0.007 (0.027)	0.040** (0.019)	-0.040*** (0.014)	0.058* (0.032)	0.013 (0.032)
Excluding MENA and Sub-Saharan Africa	-0.003 (0.005)	-0.000 (0.003)	-0.004 (0.005)	-0.001 (0.002)	0.026 (0.068)	0.024 (0.053)	0.005 (0.016)	-0.031 (0.019)	0.006 (0.040)	0.027 (0.048)
Excluding South Asia	0.001 (0.004)	0.001 (0.003)	-0.002 (0.003)	0.001 (0.002)	0.025 (0.044)	0.017 (0.026)	0.035* (0.020)	-0.032*** (0.011)	0.032 (0.031)	0.046 (0.034)
Excluding Western Europe and North America	0.005** (0.002)	0.002 (0.003)	0.002 (0.002)	0.002 (0.001)	-0.034 (0.045)	-0.030 (0.025)	0.039** (0.019)	-0.043*** (0.012)	0.031 (0.033)	0.010 (0.058)
Excluding Eastern Europe and Post-Soviet Republics	-0.000 (0.003)	0.002 (0.002)	-0.002 (0.002)	-0.001 (0.001)	-0.000 (0.043)	0.016 (0.025)	0.031* (0.017)	-0.026*** (0.009)	0.009 (0.026)	0.003 (0.028)

Source: Authors.

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