



## Income Inequality, Globalization, and the Welfare State: Evidence from 23 Industrial Countries, 1990–2009<sup>1</sup>

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*The debate regarding the welfare state–weakening effect and the income inequality–increasing effect of globalization remains a contentious issue among stratification scholars. For some, globalization increases income inequality, while for others, globalization has no, or a negligible, effect on income inequality. This study brings new evidence to bear on this debate by separately investigating effects of multiple indicators of globalization (international trade, foreign direct investment [FDI] and immigration), and of welfare state generosity (government social-protection spending) on (1) income inequality before taxes and transfers and (2) income inequality after taxes and transfers, using data from 23 Organisation for Economic Co-operation and Development (OECD) countries over 1990–2009. First, results show a positive effect of international trade, a negative effect of immigration, but no effect of FDI and government social-protection spending on income inequality before taxes and transfers. Second, results show no effect of the globalization indicators but a negative effect of government social-protection spending on income inequality after taxes and transfers. These findings suggest that (1) globalization has inequality-increasing effects depending on measures of income inequality; (2) the welfare state, in many OECD countries, continues to shape income distribution; and (3) in contrast with the popular narrative, immigration may decrease income inequality.*

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**KEYWORDS:** economy; globalization; inequality; immigration; stratification; welfare state.

### INTRODUCTION

Students of economic stratification have noted that income inequality has increased in several advanced industrial countries in the era of globalization. However, there is disagreement among scholars regarding the degree to which globalization may be implicated in the increase of income inequality and the role of the welfare state in reducing national income inequality. Some claim that globalization should have no effect on income inequality (Mahler 2004), while others implicate globalization in these income inequality upswings in many advanced industrial countries (Blanton and Blanton 2016; Kerrissey 2015; Kwon 2016; Mahutga, Anthony, and Kwon 2017). This paper brings new evidence to this debate by contrasting effects of globalization and welfare state indicators on two measures of income inequality (i.e., pretax-and-transfer and posttax-and-transfer income inequality).

Some previous research used similar measures to examine effects of globalization and the welfare state on both markets and disposable income inequality. However, these analyses did not directly account for government social

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protection spending (Mahler 2004). Other research did account for social protection spending but did not include government transfers *in kind* (social housing, housing allowances, social security, and transportation-related benefits) (Bradley et al. 2003). As a result, the measure of taxes and transfers in this earlier study did not consider the distributive profile of government transfers. These studies tended to conclude that globalization might not have any effect on national income inequality.

Should this conclusion be revisited? Analyses in this paper address this general question by (1) testing direct effects of welfare state generosity simultaneously with effects of globalization on both pretax-and-transfer and posttax-and-transfer income inequality and (2) using a more comprehensive measure of welfare state generosity that includes government transfers *in kind*, measuring the distributive profile of government transfers. The data are from 23 Organisation for Economic Cooperation and Development (OECD) member countries for the period spanning 1990–2009. The set of 23 countries used in this study is larger than those used in previous research (14 in Mahler 2004; 16 in Bradley et al. 2003). Results show that (1) one aspect of globalization (international trade) increases income inequality before government social protection spending; (2) globalization has no or little effect on income inequality after government social protection spending; (3) the welfare state's generosity (measured as social protection spending) reduces income inequality, and in contrast with a popular narrative, (4) immigration has a robust negative effect on both pretax-and-transfer and posttax-and-transfer income inequality.

Mechanisms through which globalization may affect national income inequality in advanced industrial countries are described in the remainder of the paper. Next the theoretical argument for a redistributive role of the welfare state is presented. This is followed by a description of the data, the analytical techniques, and presentation of the results. Implications of the results and limitations of the analysis are discussed in the final section.

## NATIONAL INCOME INEQUALITY AND GLOBALIZATION

While income inequality has increased in many countries in recent decades, the pace and degree of increases has varied across countries (Alderson and Nielsen 2002). Scholars implicate globalization in these income inequality upswings (Bergh and Nilsson 2010; Carter 2007). Scholars argue that economic globalization—which exposes national labor and financial markets to international competition—may contribute to increased income inequality by limiting government capacity to regulate these markets (Lindert and Williamson 2003; Richardson 1995). Globalization consists of three principal aspects: international trade, capital movements, and migration (Lindert and Williamson 2003). Some of the mechanisms through which these three aspects of globalization influence national income inequality in industrial countries are reviewed in this section. As these mechanisms are primarily based on labor-market mechanisms, they may be assumed to primarily generate inequality in the distribution of pretax-and-transfer income.

*National Income Inequality and International Trade*

While some scholars disagree on the magnitude of the effect of international trade on income distribution (Krugman and Lawrence 1993), and others question whether international trade has an effect at all (Babones and Vonada 2009), some research found international trade to increase inequality in advanced industrial countries (Kerrissey 2015; Kwon 2016; Mahutga et al. 2017).

Scholars also differ regarding factors driving trade between countries. Some research emphasizes cross-country wage differentials as the driving factor of international trade, and thereby sees differences in wages between countries as underlying mechanisms of increased national income inequality in advanced industrial countries. According to this perspective, trade in goods and services between advanced and less advanced economies puts workers in advanced economies in direct competition with workers in less advanced economies, where wages are relatively low. This process causes deindustrialization in the more advanced economies, causing unemployment, and lowers wages for some workers, and causes a movement of employment from manufacturing to the more unequal service sector (Wood 1995). Based on this logic, trade between advanced and less advanced countries would be particularly important for understanding the potential impact of international trade on income distribution in advanced industrial countries. Recent research, showing that imports from China accounted for 17% of the reduction in earnings of workers at the middle of the wage distribution in Denmark between 1990 and 2009, lends some support to this argument (Keller and Utar 2016).

However, research investigating the potential impact of imports from the Global South on inequality in 18 advanced industrial countries found that Southern imports increases income inequality only in countries with above-average levels of integration in the global market and relatively strong wage-bargaining institutions and welfare state generosity (Mahutga et al. 2017). This finding shows that although Southern imports may increase national income inequality in advanced economies, the process varies across countries.

Yet some scholars argue that wage differentials are not the principal mechanism of increased inequality in advanced nations because trade tends to be higher between countries that are economically, politically, and culturally similar (Zhou 2010). Instead, globalization may affect inequality through its impact on labor control (Alderson 2004). It is argued that international trade, whether it is among advanced countries or between advanced and less advanced countries, may affect income inequality principally by weakening labor power, thereby increasing the likelihood of job and wage losses. Recent research showing strong organized labor to be associated with low wage dispersion lends support to this argument (Kerrissey 2015). On the other hand, research finds that in the United States, for example, the decline in labor power between 1973 and 2007 is associated with increases in the wage dispersion among workers during this period (Western and Rosenfeld 2011). The moral of the labor control argument is that both North–North and North–South trade may increase labor competition in advanced industrial countries, thereby exerting downward pressure on labor organizations and their ability to negotiate better wages and working conditions, which is likely to increase income inequality.

Although scholars differ regarding mechanisms through which international trade affects national income inequality, they agree that international trade may have adverse effects on income inequality in advanced industrial countries. Arguments tend to focus on labor market mechanisms, assuming that trade primarily affects distribution of pretax-and-transfer incomes. Given the theoretical importance of both North–North and North–South trade for understanding sources of income inequality in advanced industrial countries, this study advances previous research by operationalizing international trade as total trade (i.e., as both North–North and North–South trade). Building on this literature, I formulate the following hypothesis:

*Hypothesis 1:* International trade should increase pretax-and-transfer income inequality.

### *National Income Inequality and Foreign Direct Investment*

Another aspect of globalization that is often implicated in increased income inequality is a country's flow of foreign direct investment (including both outflows and inflows), commonly referred to as capital mobility. Foreign direct investment (FDI) is investment made by a firm or an entity in a foreign firm that accounts for at least 10% of the stock of the foreign company or entity. Early research on FDI and economic inequality developed in the context of dependency theory (Bornschieer and Ballmer-Cao 1979) and world systems theory (Wallerstein 1974) and focused primarily on income inequality in developing countries (Dixon and Boswell 1996). From this perspective, FDI inflow in the developing country was a crucial factor for understanding cross-national differences in income inequality. For research on income inequality effects of FDI in OECD countries, FDI outflow has become the central focus (Alderson and Nielsen 2002). This research finds a positive association between FDI outflow and inequality in OECD countries.

The argument regarding the effect of FDI outflow on income inequality in OECD countries, like that for international trade, involves labor market mechanisms affecting pretax-and-transfer income inequality. Capital mobility is used by firms as a tool of labor control (Alderson 2004). Capital mobility increases investment opportunities for firms beyond national borders and strengthens the negotiating power of firms over government and wage-bargaining institutions such as trade unions. Capital mobility helps firms to gain tax and social spending concessions from governments, influence in their favor wage policies (minimum wage requirements), and obtain wage concessions from wage-bargaining institutions, all of which allow them to keep worker salaries low, widening the income gap (Western and Rosenfeld 2011). The way that FDI impacts national income inequality may be context-specific. For instance, research found that in contexts where human capital endowments and economic development are high, FDI has a relatively weak effect on national income inequality (Mihaylova 2015).

Although it has been shown that the mechanisms through which capital mobility influences national income inequality may vary across countries, research agrees that increased capital mobility may exert upward pressure on income inequality.

Overall, research assumes that capital mobility is likely to influence national income inequality primarily through labor-market mechanisms, suggesting that FDI may be particularly influential on pretax-and-transfer income inequality. Thus, I suggest the following hypothesis:

*Hypothesis 2:* Foreign direct investment outflow should increase pretax-and-transfer income inequality.

### *National Income Inequality and Immigration*

Another aspect of economic globalization that is associated with rising income inequality in many industrial countries is the increasing number of foreign-born workers. Although there has not been free movement of workers between countries (except for in the European Union, whose citizens are allowed to move freely between member countries), the foreign-born population has increased significantly in many countries in recent decades. The United Nations (2013) estimates the stock of immigrant population across the world to be 232 million, of which 59% live in OECD member countries alone (Regan 2013; United Nations 2013). The immigrant population in OECD countries increased by 32 million between 2000 and 2013, accounting for 9% of total population in 2009 and 11% in 2013.

Considering these trends, scholars have wondered whether immigration may be related to increased inequality observed in some of these countries. Research on this question is nuanced and inconclusive at times. For instance, Lindert and Williamson (2003) posit that during the first historical period of globalization, from about 1820 to the onset of World War I, international migration resulted in greater inequality in migrant-receiving countries of the New World (the United States and Australia) and less inequality in people-sending ones in the European periphery (e.g., Denmark, Sweden, and Italy). During the period of global retrenchment that followed World War I until about 1950, income inequality in OECD countries fell while new legal barriers resulted in reduced immigration flows, although the causal impact of migration on inequality decline during this period is not clear (Lindert and Williamson 2003). This suggests that immigration may be related to increased income inequality at one point in time and decreased income inequality at another. Thus, it is not surprising that recent research on the relationship between immigration and income inequality in advanced industrial countries remains inconclusive.

Some research finds negligible or no effect of immigration on income inequality in advanced industrial countries, whereas other research finds positive effect of immigration. For example, in the United States research found no significant effect of increased immigrant population on wage differentials between Americans who have dropped out of high school and those who have graduated (Card 2005). Research also finds that the inflow of low-skill immigrants in the United States does not have a significant impact on the wages of native-born workers (Card 2009).

Research conducted in the United Kingdom, Denmark, Sweden, and Germany echoed the U.S. findings, while some found evidence for inequality-reducing effect of immigration. Studying the effect of immigrant population on wages across various skill categories in the United Kingdom during 1980–2000, research showed that immigration did not have a significant effect on wage differentials (Dustmann and Preston 2005). Instead, in Denmark, research found immigrant populations to increase native-born workers' wages by pushing them to pursue high-skill and high-wage jobs (Foged and Peri 2016). U.S. (Ottaviano and Peri 2012) and United Kingdom (Manacorda, Manning, and Wadsworth 2012) research found similar inequality-decreasing effects of immigration. Thus, these findings provide an alternative narrative to the traditional argument emphasizing that immigration is associated with increased income inequality in advanced industrial countries.

The argument about inequality-increasing effect of immigration is often based on the assumption that immigrants can increase only the supply of low-skilled workers. However, in situations where foreign workers are recruited more heavily on the high end of the skills distribution, immigration may increase the relative supply of high-skilled workers in the receiving labor force, resulting in negative pressure on the wages of high-skilled workers relative to wages of low-skilled workers, reducing the wage gap between high-skilled and low-skilled workers. Research has documented such a scenario in Canada, where immigration policies tend to recruit workers from the high-skill end in their home countries, so that immigration has been associated with a reduction in the wage gap between high-skilled and low-skilled workers and reduced income inequality (Aydemir and Borjas 2007).

This scenario may be of particular importance for the present analysis, which uses data for the 1990–2009 period, because 17 of the 23 countries (74%) are members of the European Union (EU). The EU treaty on free movement of workers, implemented in the beginning of the 1990s, increased the movement of high-skilled workers across EU member countries, while the movement of low-skilled workers remained relatively low (Peixoto 2001). This suggests that immigration in the EU may increase the supply of high-skilled workers in the receiving labor force and exert negative pressure on wages for high-skilled workers, lowering the wage gap between low-skilled and high-skilled workers.

Although there are reasons to believe that immigration may exert negative pressures on income inequality, substantial empirical evidence implicates the foreign-born population in income inequality upswings in many advanced industrial countries (Borjas 2003; Xu, Garand and Zhu 2016). As mentioned above, the inequality-enhancing effect is viewed as a consequence of the skills composition of the immigrant pool. Immigrants tend to have lower average skills than domestic workers, but, in some cases (because of preferential admission of high-skilled workers), the immigrant pool may be “bifurcated” into low- and high-skilled groups (Borjas 2003). Immigrant inflows may thus contribute to rising inequality by increasing both the supply of low-skilled workers and skills variation in advanced industrial countries (Borjas, Freeman, and Katz 1992). This literature suggests that immigrant populations in advanced industrial countries may exert upward pressure on income inequality by lowering native workers' wages. In short, the argument

about the relationship between immigration and income inequality is mainly based on a labor market mechanism and mainly affects labor market income inequality—that is, pretax-and-transfer income inequality. Thus, I propose the following hypothesis:

*Hypothesis 3:* Immigration should increase pretax-and-transfer income inequality.

## NATIONAL INCOME INEQUALITY AND THE WELFARE STATE

Industrial economic development—which transformed occupational organizations, weakened workers' ties to the land, and increased urbanization—broke the family and community-based social protection system, compelling the state to take charge of industrial workers' social protection (Lenski 1984). The relative size of the welfare state—the degree to which the state monitors industrial markets and invests in social protection programs such as education, unemployment, health care, old age, incapacity, and family benefits—varies across industrial countries and is a major force shaping social stratification, poverty, and distributions of income in advanced industrial societies (Esping-Andersen 1990).

However, some argue that globalization, which exposes both labor and local markets for capital, goods, and services to international competition, makes it costlier for the government to finance its social protection programs and weakens the power of the state over local markets (Milner and Keohane 1996). Others instead describe increasing pressure of globalization forces on the welfare state as a moment of crisis engendering a need for welfare state restructuring (Huber and Stephens 2001). On the other hand, some scholars describe it as setbacks (Strange 1996), retrenchment, and the demise of welfare state generosity (Freeman, Swedenborg, and Topel 1997). However, using globalization indicators, such as FDI, external debt, and a country's dependence on international financial institutions (i.e., International Monetary Fund [IMF]), research found that only international trade had an adverse impact on government social protection spending, whereas dependence on global financial institutions (i.e., IMF) increased government social protection spending (Jiang 2014). Other research has found that globalization increased the share of social protection spending among public expenditures in Western Europe and decreased government social protection spending in liberal democracies, whereas globalization had no significant effect on social protection spending in social democratic countries (Onaran and Boesch 2014). These inconsistent findings in previous research call for a closer examination of the relationship between the welfare state and income inequality in the era of increasing economic globalization.

### *Globalization and the Argument for “Obsolescence” of Welfare State Generosity*

Governments across the world face increasing pressure from global market competition to reduce their control over local markets and adopt market-oriented social policies. Thus, many scholars express doubt about the ability of many industrial countries to maintain their generous welfare states (Strange 1996; Stryker

1998). Arguably, generous government social protection programs imply high taxes and government wage regulations that interfere with free market rules and reduce the ability of businesses to control costs, resulting in loss of international competitiveness. As a result, global markets put policymakers under increased scrutiny regarding spending on social protection programs, tax policies, and labor market regulations (minimum wage requirements), forcing welfare states to engage in a race to the bottom (Devereux, Lockwood, and Redoano 2008; Gilbert 2002). The implication is that in the face of globalization forces, the welfare state's redistributive power has been squeezed and relegated to market forces. These scholars argue that welfare state generosity is unsustainable in the era of economic globalization and the welfare state should consequently lose the ability to shape economic inequality (Alesina and Perotti 1997).

In a nutshell, this argument implies that welfare state generosity might have become so weak that empirical research would find negligible or no impact of government social protection spending on economic distribution. The present analysis reevaluates this implicit assertion by estimating the direct effect of government social protection spending on national income inequality, net of globalization forces.

#### *Globalization and the Argument for Persistence of Welfare State Redistributive Power*

Contrasting the obsolescence argument, other scholars expect the welfare state to remain an influential force shaping economic distributions in the era of globalization. As globalization increases economic insecurity, demand for welfare state social protection programs may increase rather than decrease (Rodrik 1998). Although the welfare state may experience pressures to cut back on social protection spending under economic globalization, domestic politics and favorable public attitudes toward social-protection policies may resist welfare state retrenchment (Scharpf and Schmidt 2000). For example, national political processes—such as veto points<sup>3</sup> (Immergut 1990), path dependency of policies (Pierson 2000), and the sheer popularity of certain social protection programs may make it difficult for a government to adopt austerity measures regardless of globalization pressures. Scharpf and Schmidt (2000), for instance, noted that nearly all advanced industrial countries included in their analysis responded to increasing economic globalization by strengthening regulation of financial and labor markets and social policies aimed at protecting their citizens against market adversities. Research has also found that governments' involvement in social programs tended to be larger in the most open economies than those that are less integrated in the international market (Rodrik 1998).

In the same vein, research found that public sector spending (Kollmeyer 2015) and public sector employment (Lee, Kim, and Shim, 2011) exert downward pressure on income inequality. Some research has suggested that persistence of welfare state

<sup>3</sup> Veto points is defined as “aspects of constitutional structure that disperse political power and offer multiple points of influence on the making and implementation [of government policies]” (Huber, Ragin, and Stephen, 1993:722). Veto points increase the ability of political actors to block legislation, reducing the likelihood of major policy shifts in a political system characterized by relatively large veto points.



generosity and its influence on economic distribution in the era of globalization may partly be because losers of globalization would tend to vote for social protection programs, consequently forcing the governments to increase social spending protection (Walter 2010). That is because experiences with economic adversity tend to increase demand for government social protection programs (Immervoll and Richardson 2011; Rodrik 1998), which one could expect to put downward pressure on income inequality. A sign of the protective nature of government social programs is evident in recent U.S. census data showing that the proportion of American families falling into poverty due to the recent recession decreased significantly after controlling for government spending on nutrition assistance programs (Census Bureau 2013).

The moral of this argument is that domestic policies, such as government social protection programs, remain influential forces shaping national markets, stratification, and distribution, even in the face of increasing economic globalization. This paper contributes new empirical evidence shedding light on the resilience of the welfare state's redistributive power in the area of economic liberalization by examining the effect of welfare generosity on income inequality, net of the effect of economic globalization. Thus, I formulate the following hypothesis:

*Hypothesis 4:* Welfare state expansion should decrease posttax-and-transfer income inequality.

## DATA

The data set is an unbalanced panel of observations on 23 OECD countries for the 1990–2009 period (Table I). The data set is unbalanced due to uneven contributions of countries to the total number of country-year observations. For example, the United States contributes 20 years of data (1990–2009), whereas Switzerland contributes 15 years (1994–2007) and Belgium contributes 6 (2002–2007).

### *Dependent Variables: Income Inequality*

The outcome variables include two measures of income inequality: (1) *pretax-and-transfer Gini coefficient* and (2) *posttax-and-transfer Gini coefficient*. Income inequality data are collected from the Standardized World Income Inequality Database (SWIID) (Solt 2009). The SWIID contains income inequality data for both pretax-and-transfer income and posttax-and-transfer income. The Gini coefficient is expressed as a percentage, ranging from 0 to 100. The closer a country's Gini coefficient is to 0, the less unequal the country; the closer Gini is to 100, the more unequal the country.

The Luxembourg Income Study (LIS) and the World Income Inequality data (WIID) produced by the World Institute for Development Economics Research of the United Nations University (UNU-WIDER) are two other commonly used sets of cross-national income inequality data. The LIS provides the most reliable income inequality data because it harmonizes concepts and measurements of income across countries to create its income inequality measures. However, LIS income inequality

**Table I.** Country Averages, 23 OECD Countries, 1990–2009

1	2	3	4	5	6	7	8	9
Countries	Years	Pre-Gini	Post-Gini	SPS	% Reduction in Pre-Gini	Trade	FDI	Immigration
Denmark (EU)	1990–2003 & 2005–2009	48.01	23.49	27.38	51.08	78.71	0.26	5.54
Sweden (EU)	1992–2009	45.94	22.77	30.37	50.44	78.80	0.61	11.68
Norway	1991, 1993–2009	44.94	23.83	22.63	46.98	70.91	0.20	7.16
Finland (EU)	1995–2002 & 2002–2009	45.34	24.19	26.65	46.63	72.45	0.30	3.01
France (EU)	1999–2008	49.18	27.33	29.58	44.44	52.45	3.68	10.47
Austria (EU)	1998–2009	47.32	26.57	27.07	43.85	96.05	0.31	13.61
Germany (EU)	1994–2003 & 2005–2009	50.05	28.23	26.65	43.59	65.01	2.19	12.39
Netherlands (EU)	1990–2009	44.71	25.69	22.03	42.55	113.61	1.38	9.99
Portugal (EU)	1995–2009	58.03	35.22	20.36	39.31	61.33	0.22	5.82
Czech Republic (EU)	1998–2004 & 2006–2009	41.83	25.79	19.03	38.35	116.03	0.04	5.11
Hungary (EU)	1995 & 1997–2008	45.46	28.76	21.97	36.73	116.97	0.08	3.12
Luxembourg (EU)	2002–2008	42.71	27.81	22.02	34.87	297.32	0.23	35.21
Belgium (EU)	2002–2007	38.75	25.54	26.27	34.08	152.68	1.20	11.98
Switzerland	1994–2008	43.08	28.60	18.70	33.61	81.84	0.85	22.70
Slovakia (EU)	2001–2008	36.11	24.37	16.60	32.52	152.77	0.02	4.75
United Kingdom (EU)	1991–2009	47.98	34.37	19.94	28.36	48.78	3.29	8.26
Australia	1990 & 1999–2009	43.04	30.96	16.38	28.07	36.77	0.28	23.69
Canada	1990–2009	41.95	30.31	18.05	27.74	66.22	0.87	17.47
New Zealand	1998–2000, 2002, 2003, 2006	44.97	32.94	18.90	26.75	53.95	0.04	18.71
Ireland (EU)	1996–2009	41.87	31.30	16.37	25.25	144.65	0.29	11.18
United States	1990–2009	46.28	36.21	15.59	21.77	22.96	4.31	11.11
Spain (EU)	1997–2009	38.64	32.37	21.21	16.23	53.83	1.89	8.71
Estonia (EU)	2000–2009	38.85	33.75	14.07	13.14	146.45	0.04	17.49

*Note:* EU indicates that the country is a member of the European Union in this time period. Countries are sorted in descending order of values of % reduction in pretax-and-transfer Gini.

Pre-Gini: pretax-and-transfer Gini; Post-Gini: posttax-and-transfer Gini; SPS: social protection spending as % of GDP; Trade: international trade as % of GDP; FDI: FDI outflow as % of GDP; Immigration: immigrant population as % of native population.

data are available for a very limited number of countries and data are collected only every five years for some countries. The UNU-WIDER database contains income inequality measures for a wider range of countries but includes income data from countries with different concepts and measures of income, which reduces cross-country comparability.

Based on information from country years (household per capita, household adult equivalent, household without adjustment, employee, and person) where the

LIS and UN-WIDER data sets overlap, SWIID synchronizes the LIS data with the UNU-WIDER data using Gini ratios from the LIS data and information on income concepts from the UNU-WIDER data. As a result, the SWIID replicates the cross-country comparability of the LIS data and the large coverage of the UNU-WIDER data. The SWIID generates 100 separate imputations of the inequality estimates and their standard errors to address incomparability concerns. Hence, research found the SWIID estimates to be consistent with other valid data sets, such as the University of Texas Inequality Project's Estimated Household Income Inequality (EHII) (Galbraith et al. 2015). More detail on the methodology of the SWIID is provided in Solt (2009).

### *Explanatory Variables*

*International trade* is measured as exports plus imports as a percentage of real GDP. Data are drawn from the Penn World Tables (Heston, Summers, and Aten 2012). *Foreign direct investments outflow* is measured by total direct investment abroad as a percentage of real GDP. Data are from the OECD Globalization Statistics (various years). FDI outflow, rather than inflow, is the central concept in theorizing on inequality in developed countries. *Immigration* is measured as the foreign-born population as a percentage of total population. Data are from OECD Demographic and Population Statistics (various years).

*Social protection spending (SPS)* is the measure of welfare state generosity. It is measured as government spending on social protection programs, including old age, health, family, housing, unemployment, social security, and survivor-and-incapacity-related benefits, as a percentage of GDP. This measure of welfare state generosity includes *in kind* government services and transfers,<sup>4</sup> which are omitted from a measure of welfare state generosity used earlier (Bradley et al. 2003). Given this omission in their measure of social protection, Bradley and colleagues (2003:199) stated that "our measure of taxes and transfers does not measure the distributive profile of transfers." SPS data are drawn from OECD Social Expenditure Database (various years) and measured as a percentage of GDP.

### *Control Variables*

The analysis accounts for a country's educational endowment, population size, and a set of variables reflecting labor market institutions, economic development, and economic productivity.

*Union density* is measured as the ratio of wage and salary earners who are trade union members to the total number of wage and salary earners, from Visser (2011). Income inequality has been found to be lower in countries where wage bargaining

<sup>4</sup> Government transfers in kind consist of goods and services provided to individuals and households. They include social security benefits, which "consist of reimbursement by social security funds of approved expenditures made by households on specific goods or services." They also include social housing, housing allowance and reduction of transportation prices. See OECD Social Expenditure Database (2014) for a more detailed explanation of the components of social-protection spending measures used in this study: <http://www.oecd.org/els/soc/Annex-Description-Projections-SOCX2014.pdf>.

institutions are stronger (Bradley et al. 2003). *Real gross domestic products (GDP) per capita* is the measure of economic development. GDP is measured at purchasing power parity; data are from Heston et al. (2012). Research has shown economic development to be related to national income inequality, in possibly complex ways (Barro 2000). *Labor productivity* is measured as GDP per hour worked. Data are from OECD Labour Productivity Statistics (various years). Labor productivity is controlled in the analysis because scholars have argued that economic inequality tends to increase economic efficiency and productivity by creating incentives for good work and skill improvement (Mankiw 2013). Thus, cross-country variation in income inequality may mirror cross-country variation in economic productivity (Acemoglu 1998). Accounting for labor productivity also addresses the skill-biased technological change (SBTC) argument, as the SBTC theory assumes workers' skill differentials—often used as a proxy for productivity differentials—as a major driving force of income inequality (see Lemieux [2008] for a recent review). In addition, educational differences have been implicated in wage inequalities. Thus, some have argued that increased demand for high-skilled/educated workers to be an important factor in explaining income inequality upswings observed in many advanced industrial countries in recent decades (Lemieux 2006). Given this argument, the present analysis controls for educational endowment to account for potential cross-national differences in national income inequality that may be due to cross-national differences in educational endowment. The data are drawn from the Barro-Lee Educational Attainment Dataset (Barro and Lee 2013). Finally, the population variable is measured as the total population of a country for each year of the data that the country contributes to the data set. The population data were drawn from OECD Demographic and Population Statistics (various years).

## METHODS

Ordinary least squares (OLS) regression, which assumes independence of errors, is inappropriate for a longitudinal dataset such as this (Hsiao 2003). A likely source of bias with OLS is omission from the regression model of country-specific factors that are time-invariant, or vary little over time, such as political culture or endowment of natural resources. Such misspecification would result in over-time correlation of errors and biased coefficient estimates. Another potential source of bias—probably less important given the strong comparability of the SWIID data—would be residual methodological differences across countries in estimating income inequality.

The random-effects model (REM) and fixed-effects model (FEM) are two common estimation techniques that have been used to correct for unmeasured country-specific and time-invariant factors. Both the REM and FEM estimate time-invariant factors as country-specific intercepts. The FEM estimates a time-invariant intercept and assigns all between-country variations to that intercept, while keeping within-country variation. Because time-invariant variables are entirely confounded with country-specific intercepts, the FEM cannot estimate effects of variables that do not change over time for a given country. It only

estimates the effects of variables that vary both across countries and across time. Unlike in the FEM, where the entire cross-country variation is discarded, REM estimation treats the time-invariant intercepts as random factors, subtracting only a portion of country-specific means and utilizing both within- and between-country variation (Hsiao 2003).

There has been some debate about which of the FEM and REM is the most appropriate methodology for cross-national longitudinal data such as these. Some researchers have preferred the REM on the ground that much of the variation in income inequality is between- rather than within-country, and the REM reflects more of this variation as well as allowing inclusion of time-invariant variables. Others have criticized the REM for not controlling “enough” for unmeasured country-specific heterogeneity, so bias in coefficient estimates remains. Thus, to determine the most appropriate estimation strategy for these data, I conducted several preliminary tests. First, using the Hausman test, I examined whether the heteroskedasticity problem might potentially bias the regression estimates. These preliminary examinations demonstrated significant differences in the REM and FEM estimates, meaning that the FEM is a preferable estimation technique for these data. Furthermore, Wooldridge tests revealed significant autocorrelation in the data. Given the results of these diagnostic tests, this analysis uses the Driscoll-Kraay estimation techniques with robust standard error and country-specific fixed-effects, which assumes the error structure to be heteroskedastic and autocorrelated. In addition, the Driscoll-Kraay technique also allows estimation of both balanced and unbalanced panel data. Given the unbalanced nature of this data set (as described above), the Driscoll-Kraay technique is appropriate for this analysis.

## RESULTS

### *Descriptive Analysis*

Figure 1 compares trajectories of income inequality, pre- and posttax-and-transfer, across the 23 countries in the data set from 1990 to 2009. Vertical and horizontal scales of the panels are the same, so trajectories can be visually compared. Several patterns are visible. Looking at inequality in “take home” income—i.e., posttax-and-transfer income—it is apparent that some countries, such as the Nordic countries, generally experienced lower levels of inequality over the period than others, such as Estonia and Spain, but also the English-speaking democracies (the United States, United Kingdom, New Zealand, and Ireland). Second, trajectories of posttax-and-transfers over the period are varied, with some countries experiencing an upswing (Australia, Canada, Germany, and the United Kingdom), and others a trend of declining inequality (Estonia and Ireland). The case of the United States is more complicated, with an inequality upswing at the beginning of the period followed by a decline in later years. Third, in all countries in a given year, posttax-and-transfer inequality is less than pretax-and-transfer inequality, confirming the redistributive role of taxes and transfers. Finally, the gap between trend lines for pre- and posttax-and-transfer inequality, a measure of the impact of taxes and transfers on inequality, varies widely, a pattern on which I focus next.

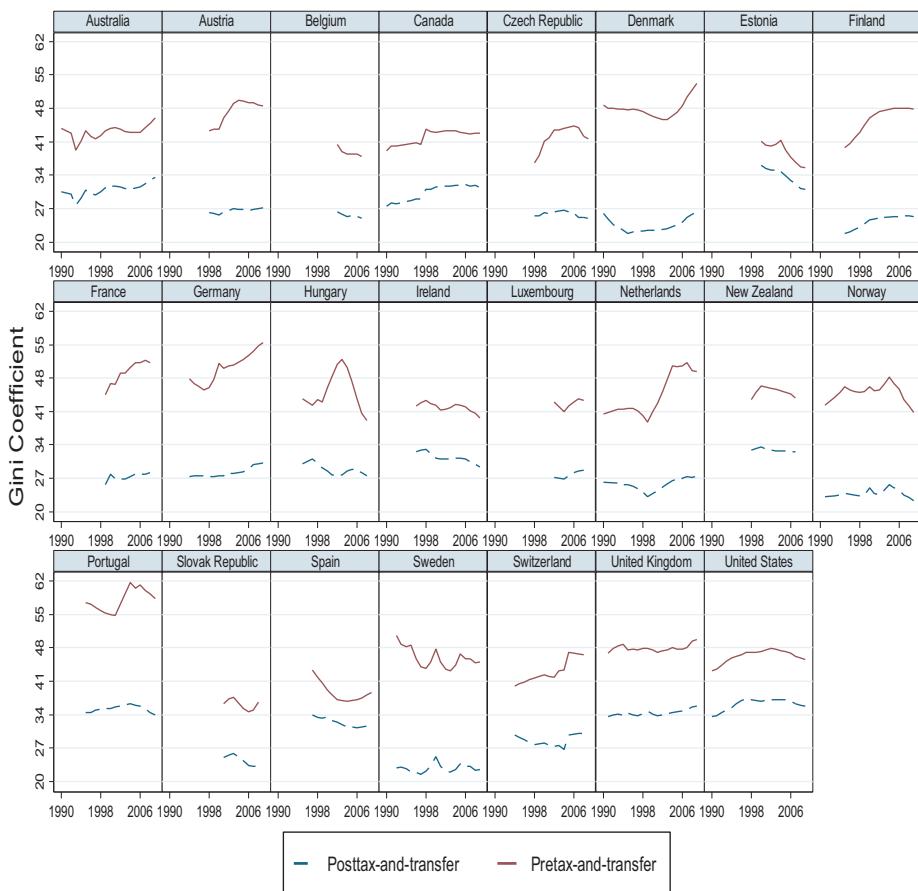
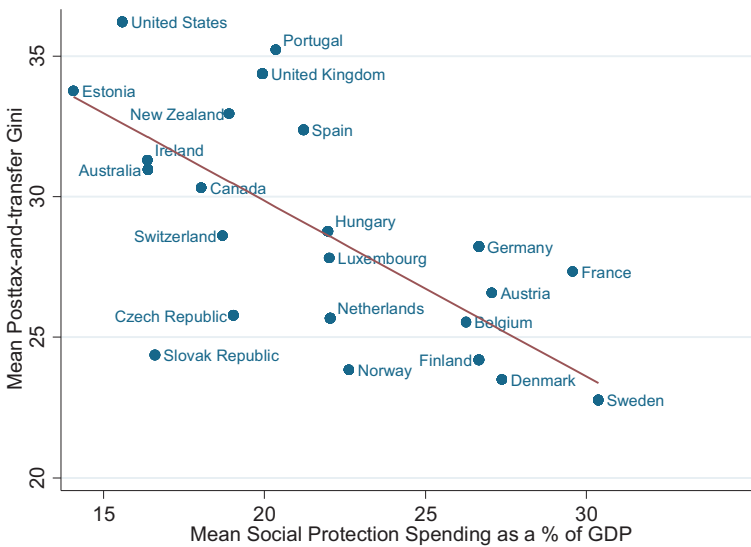


Fig. 1. Trend in income inequality across 23 OECD countries, 1990–2009.

Table I shows country averages over the period for the principal substantive variables. Countries in the table are sorted in decreasing order of the percent difference between pre- and posttax-and-transfer income inequality, which is positive on average for all countries, indicating that the overall effect of taxes and transfers is to reduce income inequality. The posttax-and-transfer reduction in inequality varies considerably, from highs of 51% for Denmark and 50% for Sweden to lows of 16% for Spain and 13% for Estonia. Social protection spending, the measure of welfare state generosity, also varies substantially, from a maximum of 30% of GDP for Sweden and France to a minimum of 14% for Estonia, which just manages to beat the United States (at 16%) for the bottom position. Juxtaposition of columns 5 and 6 suggests that countries with larger reduction in inequality (located at the top of the table) also tend to spend more on social protection, with values in the 20%–30% range, than countries with low reduction (located at the bottom), that tend to have social protection values in the 10%–20% range, although the association is far



**Fig. 2.** Posttax-and-transfer Gini coefficient against social protection spending for 23 OECD countries, 1990–2009 Averages

from perfect. Likewise, countries with higher levels of social spending (column 5) tend to have lower levels of posttax-and-transfer inequality (column 4).

Figure 2 examines more closely the relationship between posttax-and-transfer inequality and social protection spending. The simple regression line fitted to the points is negative, corresponding to a moderately strong linear correlation of  $-0.652$ . Examination of columns 7 to 9 of Table I showing averages over the period for the three measures of globalization (international trade, FDI outflow, and immigration) does not reveal strong relationships with reduction in inequality due to taxes and transfers. For example, dependence on international trade does not seem to be strongly related to inequality reduction (nor to either of the two inequality measures).

These preliminary analyses show that the more generous the welfare state, the lower posttax-and-transfer income inequality. This pattern suggests that welfare state generosity may matter for income distribution. I use multivariate analyses controlling for other factors, which have been proposed to affect national income distributions to examine: (1) whether globalization indicators have some effect on either of the two measures of income inequality and (2) whether the redistributive effect of welfare state generosity demonstrated by the descriptive analysis is robust accounting for globalization forces.

#### *Modeling the Effects of Globalization and Welfare State Generosity on Pretax-and-Transfer Income Inequality (Table II, Models 1–3)*

Models 1–3 of Table II estimate the effects of globalization on pretax-and-transfer income inequality. Model 1 shows that international trade has a highly significant positive effect on inequality of incomes before taxes and transfers.

**Table II.** Fixed-Effects Driscoll-Kraay Robust Standard Error Regression Models of Income Inequality (Gini coefficient) on Selected Independent Variables: 23 OECD Countries, 1990 to 2009

Variables	Pretax-and-transfer Gini coefficient			Posttax-and-transfer Gini coefficient		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
International trade (exports + imports, % of GDP)	0.0615*** (0.0205)	0.0670** (0.0264)	0.0499** (0.0202)	0.00971* (0.00548)	0.0172** (0.00685)	-0.00367 (0.0116)
FDI (outflow of capital, % of GDP)	-0.0203 (0.138)	-0.0114 (0.131)	-0.201 (0.127)	0.122* (0.0706)	0.0958 (0.0753)	-0.0544 (0.0706)
Immigrant pop. (% of native pop.)	-0.0471 (0.0955)	-0.0805 (0.122)	-0.463*** (0.152)	0.00977 (0.0448)	-0.00350 (0.0516)	-0.376*** (0.0578)
Social protection spending (% of GDP)		0.0710 (0.0866)	-0.0406 (0.115)		-0.0862*** (0.0159)	-0.169*** (0.0342)
Union density (% of salary & wage earners)			-0.154 (0.101)			-0.101*** (0.0263)
Logged GDP per capita			-17.38*** (5.419)			-12.96*** (2.606)
Logged GDP per capita squared			0.322 (0.231)			0.343*** (0.110)
Labor productivity (GDP per hour worked)			-0.0100* (0.00567)			0.00126 (0.00134)
Population size logged			11.39* (5.986)			18.16*** (3.085)
Education (average total years of schooling)			0.296 (0.277)			0.418** (0.149)
Year			0.526*** (0.173)			0.174* (0.0929)
Constant	40.51*** (1.056)	38.92*** (2.592)	-1,098*** (338.3)	27.79*** (0.494)	29.19*** (0.476)	-627.2*** (153.1)
Observations	316	313	313	316	313	313
Number of countries	23	23	23	23	23	23

Standard errors in parentheses.

\*\*\*  $p < .001$ , \*\*  $p < .01$ , \*  $p < .05$ .

However, FDI outflow and immigration have no effect on pretax-and-transfer income inequality in model 1, a pattern consistent with some previous research findings of negligible effect of FDI and ambiguous effect of immigration on income inequality (Alderson and Nielsen 2002). Model 2 adds social protection spending along with globalization indicators. SPS has no effect on pretax-and-transfer income inequality, while the effect of international trade on pretax-and-transfer remains positive and robust.

To test whether the effect of globalization observed in models 1 and 2 is robust after controlling for institutional and internal economic factors, model 3 adds a



measure for wage-bargaining institutions (union density), for economic development (real GDP per capita), and for economic productivity (GDP per hour worked). Model 3 also controls for education, year, and GDP per capita squared to account for cross-national differences in human capital endowment, period effects, and potential nonlinear relationship between economic development and income inequality, respectively. Union density and labor productivity both significantly reduce pretax-and-transfer income inequality. These results are consistent with previous research that shows economic productivity and unions to decrease income inequality. The results also show that the coefficient for GDP per capita is negative and significant, whereas the coefficient for GDP per capita squared is positive but nonstatistically significant.

Model 3 also shows that the effect of international trade on pretax-and-transfer income inequality remains highly significant and positive, and the effect of FDI outflow remains nonsignificant. However, immigration now has a significant *negative* effect on pretax-and-transfer inequality, contrary to the commonly hypothesized positive effect. The negative effect of immigration on income inequality might be thought due to longitudinal changes in characteristics of the immigrant labor pool that increase the supply of high-skilled relative to less-skilled workers. The negative effect of immigration on pretax-and-transfer income inequality may also be attributed to immigrants' contribution to aggregate income through increased productivity, job creation and/or purchasing power of the economy. In any case, the finding of a negative effect of immigration on income inequality contradicts the popular narrative that immigrants tend to have lower skills than native workers and tend to increase the supply of low-skilled workers in industrial countries, thereby putting downward pressure on wages for low-skilled workers relative to their high-skilled counterparts and increasing inequality. Thus, this finding supports a less pessimistic view of the relationship between immigration and national income inequality in advanced industrial countries.

*Modeling the Effects of Globalization and Welfare State Generosity on Posttax-and-Transfer Income Inequality (Table II, Models 4–6)*

Models 4–6 of Table II regress posttax-and-transfer income inequality on the same set of explanatory variables to investigate the possibility that globalization may have a differential effect on inequality in the distribution of disposable income. Model 4 shows that international trade has a positive effect on posttax-and-transfer income inequality. But the effect of international trade on posttax-and-transfer income inequality is smaller (0.009,  $p < .05$ ) than its impact on pretax-and-transfer income inequality (model 1, 0.0615,  $p < .001$ ). FDI outflow now has a significant positive coefficient. The positive effect of FDI outflow on posttax-and-transfer income inequality suggests that FDI outflow reduces the effectiveness of taxes and transfers in reducing inequality. One way such an inequality-enhancing effect may appear is if FDI outflow reduces the amount of taxable income and thus, because government transfers are a function of income, exerts downward pressure on government transfers. This mechanism would diminish the effectiveness of taxes and

transfer in reducing income inequality. Alternatively, this finding may also support Alderson's (2004) argument that FDI serves as a control on social wages, measured as social security transfers.

Social protection spending is included in Model 5 together with the three measures of globalization to test the robustness of the negative relationship between posttax-and-transfer income inequality and SPS shown in Fig. 2, in particular whether welfare state generosity maintains its redistributive effect controlling for the globalization indicators. Model 5 shows that SPS retains a significant negative association with posttax-and-transfer income inequality, but the coefficient is small. The effect of FDI outflow disappears when SPS is included, whereas the effect of international trade remains positive and significant ( $0.0172, p < .01$ ). Model 6 adds the controls for the strength of wage-setting institutions, economic development, productivity, education, population size, and year and is comparable to model 3. International trade and FDI outflow have no effect on posttax-and-transfer income inequality in this model, while SPS remains negative and significant ( $-0.169, p < .001$ ). The effect of immigration turns significant and negative, and union density has a significant negative effect. Consistent with previous research, Model 6 shows that the coefficient for GDP per capita squared is positive and significant, whereas the coefficient for GDP per capita is negative.

The results of Table II suggest overall that of the three main aspects of globalization, only one, dependence on international trade, plays a systematic role in increasing inequality of the distribution of pretax-and-transfer incomes. The impact of trade on inequality of posttax-and-transfer incomes is nonsignificant or much reduced in magnitude, depending on model specification. FDI outflow plays a minimal role in generating inequality of any kind in these advanced economies. In model specifications where the effect of immigration is significant, it is in a negative direction opposite to that commonly assumed. Economic productivity decreases income inequality, whereas economic development has an inconsistent relationship with income inequality, which I will investigate further in the third phase of this analysis. Social protection spending does not significantly affect pretax-and-transfer inequality but does affect posttax-and-transfer inequality in the predicted (negative) direction. That is, social protection spending reduces post- but not pretax-and-transfer income inequality.

### *Robustness Analysis*

I establish the robustness of the results by excluding from the sample the four former communist countries (i.e., Czech Republic, Hungary, Slovakia, and Estonia). This is important because communist history may have distinct influence on stratification processes in these countries compared to countries with no communist heritage. However, the results are robust to the exclusion of the former communist countries (Table III). Furthermore, given the potential for correlation between some of the key independent variables, I use variance inflation factors (VIF) to assess potential multicollinearity problems. The test shows a VIF that is above the threshold of 10, indicating potential multicollinearity issues. I address this potential problem by mean-centering the variables with a VIF above the customary threshold

**Table III.** Fixed-Effects Driscoll-Kraay Robust Standard Error Models of Income Inequality (Gini Coefficient) on Selected Independent Variables: 19 OECD Countries, 1990–2009 (Excluding Former Communist Countries: Czech Republic, Hungary, Slovakia, and Estonia)

Variables	Pretax-and-Transfer Gini Coefficient			Posttax-and-Transfer Gini Coefficient		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
International Trade (exports + imports, % of GDP)	0.126*** (0.0271)	0.142*** (0.0236)	0.0703** (0.0277)	0.0425*** (0.0125)	0.0407*** (0.0136)	-0.0103 (0.0175)
FDI (outflow of capital, % of GDP)	-0.0962 (0.135)	-0.0540 (0.116)	-0.198 (0.116)	0.0804 (0.0756)	0.0758 (0.0755)	-0.0323 (0.0625)
Immigrant pop. (% of native pop.)	-0.266* (0.131)	-0.381*** (0.118)	-0.561** (0.204)	-0.0965 (0.0659)	-0.0838 (0.0696)	-0.383*** (0.0781)
Social Protection Spending (% of GDP)		0.276*** (0.0757)	0.0272 (0.108)		-0.0303 (0.0256)	-0.118** (0.0427)
Union Density (% of salary & wage earners)			0.0160 (0.0928)			-0.106*** (0.0344)
GDP per Capita (logged)			-4.457 (6.263)			-6.026 (3.939)
Logged GDP per Capita Squared			0.0107 (0.235)			0.199 (0.140)
Labor Productivity (GDP per hour worked)			-0.0328*** (0.0103)			-0.00568 (0.00527)
Population Size (logged)			1.524 (8.992)			8.628 (5.448)
Average Total Years of Education			-0.0646 (0.326)			0.346** (0.132)
Year			0.530** (0.195)			0.118 (0.0961)
Constant	39.37*** (1.125)	33.38*** (2.113)	-989.6** (361.9)	26.73*** (0.463)	27.39*** (0.882)	-355.7** (143.8)
Observations	275	275	275	275	275	275
Number of Countries	19	19	19	19	19	19

Standard errors in parentheses.  
 \*\*\*  $p < .01$ , \*\*  $p < .05$ , \*  $p < .10$ .

of 10. Doing so significantly reduced the overall VIF below the threshold of 10. And results with the mean-centered variables remain consistent with the hypothesized outcomes (results are available on demand).

## DISCUSSION AND CONCLUSION

Whether globalization affects national income distribution and the welfare state continues to shape the distribution of income have been contentious issues. This

analysis contributes to this debate in several ways. First, by separately examining the effects of globalization on pretax-and-transfer and posttax-and-transfer income inequality, it shows that aspects of globalization may have differential effects on pre- and posttax-and-transfer inequality in ways that previous research based only on pretax-and-transfer income inequality could not ascertain. Second, by evaluating effects of welfare state generosity jointly with effects of globalization and other important internal forces (such as wage-bargaining institutions, labor productivity, human capital, and economic development), this analysis shows that globalization increases pretax-and-transfer income inequality and has no significant effect on posttax-and-transfer income inequality. The analysis demonstrates that the welfare state has a robust and negative effect on posttax-and-transfer income inequality, net of globalization forces. Previous research that examined the effect of globalization on pretax-and-transfer and posttax-and-transfer income inequality, without controlling for SPS jointly with globalization indicators, failed to show these nuances in the relationships between globalization, the welfare state and income inequality.

The robust positive effect of international trade on pretax-and-transfer income inequality supports previous research suggesting caution regarding claims dismissing any effect of globalization on income inequality. This result suggests that at least that one aspect of globalization contributes to increasing income inequality in developed countries. The findings that none of the three measures of globalization has a robust positive effect on posttax-and-transfer income inequality suggest the need for research inquiring about the potential implication of globalization in increased income inequality, and to be open to the possibility that the effect of globalization on income inequality may be conditioned by whether income inequality is measured from market or disposable income. In other words, these findings suggest that conclusions regarding the effect of globalization on income inequality should specify whether income inequality is measured before or after taxes and transfers. As results here show, research that uses pretax-and-transfer income may conclude that globalization increases income inequality, while research that uses posttax-and-transfer income may suggest that globalization has no effect.

In addition, the result that welfare state generosity has a robust negative effect on posttax-and-transfer income inequality, net of globalization variables, signals that welfare state generosity still matters for income distribution in the era of globalization, contrary to what many argue. In other words, these findings imply that the welfare state's ability to provide an acceptable living standard to its members independent of their participation in the labor market continues to be crucial for income distribution, even when accounting for globalization forces. That is because governments' social safety net programs may protect individuals against adversities of the labor market, such as job and wages losses. These results also suggest that while the welfare state in the countries under study here may have undergone considerable pressure to adopt austerity measures and to relegate social protection of their members to market forces in the era of globalization, many of these countries manage to maintain levels of social-protection spending that protect their vulnerable members against adverse consequences of exposure to the liberal global market, suggesting caution regarding the claim that globalization may have made welfare state generosity unsustainable and obsolete.

Results also suggest that globalization forces do not affect income inequality in a similar way. Some aspects of globalization may increase income inequality, some may have no or negligible effect, whereas others may contribute to reduce income inequality. International trade appears to be the main income inequality-increasing aspect of globalization across the 23 countries, and this effect is only robust for pretax-and-transfer income inequality. FDI outflow does not affect pretax-and-transfer income inequality but does have some effect on posttax-and-transfer income inequality; that latter effect disappears, however, when accounting for welfare state generosity. On the other hand, immigration has a robust and negative effect on both pre- and posttax-and-transfer income inequality, which is rather surprising given that the debate concerning the role of immigration in income inequality in advanced industrial countries has been primarily focused on whether immigration increases or has no effect on income inequality. In contrast with the popular narrative, this analysis shows that an increase in foreign-born population may be associated with decreased income inequality.

Due to data unavailability, the measure of the welfare state used here does not capture other aspects of social policy, such as monetary policies and minimum wage regulation, which have been presented as affecting income distribution. Monetary policies may potentially affect both pretax-and-transfer and posttax-and-transfer income. For example, low-inflation monetary policies tend to benefit the wealthy, increasing inequality, while full employment policies tend to benefit the poor, reducing both pretax-and-transfer and posttax-and-transfer income inequality (Boix 1998). When and if the required data become available, future research should find development of the welfare state to reduce both posttax-and-transfer and pretax-and-transfer income inequality.

Finally, while data limitation constrains the conclusion of this study regarding the effect of the welfare state on pretax-and-transfer income inequality, the analysis provides evidence for the argument that globalization may have a largely positive effect on pretax-and-transfer inequality but has no systematic nor robust effect on posttax-and-transfer income inequality. The results demonstrate the effectiveness of the welfare state in reducing income inequality even when accounting for globalization forces. This is demonstrated by the findings that none of the three measures of globalization has a positive effect on posttax-and-transfer income inequality, while social protection spending has a robust and negative effect on posttax-and-transfer income inequality.

In conclusion, this analysis generally supports the argument for persistence of welfare state generosity and its redistributive power in many advanced societies. This analysis advanced the literature by showing that globalization may exert both upward and downward pressure on income inequality, which is demonstrated by the increasing effect of international trade on pretax-and-transfer income inequality and decreasing effect of immigration on both pre- and posttax-and-transfer income inequality. Thus, this study calls for more nuanced and systematic analysis on understanding the complexity in the relationship between globalization, the welfare state and income distribution.

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