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The "Forgotten" Middle Class: An Analysis of the Effects of Globalisation*

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Abstract

This paper studies the effects of globalisation on the income share of the middle class. Our findings suggest that globalisation, proxied by the KOF Economic Globalisation Index, reduces the income share of the middle class. The income share of the poorest 20% also drops due to globalisation, while that of the richest 20% increases. When we distinguish between de facto and de jure globalisation, we find that only de facto measures have statistically significant effects on income shares and inequality measures. Our results are robust for alternative definitions of the middle-class income share and hold for trade and financial globalisation.

Keywords: middle class; income inequality; globalisation; income shares

JEL-codes: D31; F62; I24; O15

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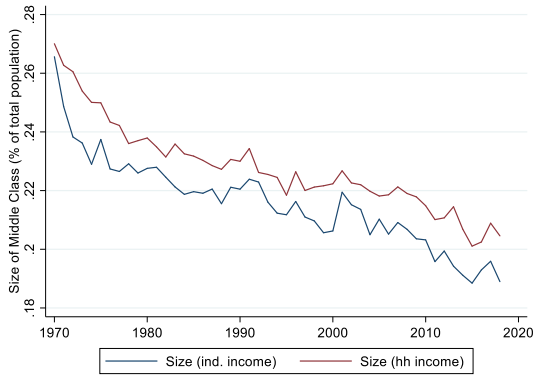
1. Introduction

This paper examines the effect of economic globalisation on the income share of the middle class. Previous cross-country studies of the impact of globalisation on income inequality mostly focused on either an overall measure of inequality (such as the Gini-coefficient, Atkinson or Theil indices), poverty, or the top 10% income share. As a consequence, the position of the middle class has received scant attention. Inequality changes not only because the rich become richer or the poor get poorer, but also when individuals move between income fractions. In particular, during the last decades the size of the middle class in the U.S. declined, because individuals either moved to higher- or lower-income groups (Alderson et al., 2005). Using information from the Current Population Survey, Figure 1 presents two different measures that capture the size of the middle class in the United States. Both measures indicate a downward trend in the size of the middle class.[1] In general, analysing the size of the middle class requires detailed data on individual or household incomes. Due to the limited availability and coverage of household surveys across the world, our analysis focuses on the income share of the middle class.

Figure 1: Size of Middle Class in the United States.



Notes: Graph shows the size of the middle class in the United States. We show two different measures using either individual (blue line) or household (red line) incomes. The measures denote the percentage of individuals or households that have an income between 75% and 125% of the median income (Atkinson and Brandolini, 2011; Thurow, 1984) divided by total population (in the sample). In general, both measures have a declining trend suggesting a decrease in the size of middle class over time. The same conclusions can be drawn using alternative cut-offs, such as 60% and 225% of the median (Blackburn and Bloom, 1985). Using larger intervals amplifies the magnitude of the decline.
Source: Current Population Survey (CPS).

[1] This trend seems present elsewhere as well. Pressman (2007) examines the size of the middle class in eleven countries and reports that in several (but not all) countries the size of the middle class declined significantly between the late 1970s/early 1980s and the end of the twentieth century. This decline seems to result much more from households falling into the lower class than from upward class mobility.

There is a large literature on defining and measuring the middle class. Typically, being 'middle class' is defined as having an income within some symmetric interval around the median (Ravallion, 2010). We follow Atkinson and Brandolini (2011) and Easterly (2001) and define the middle class as the range from the 20^{th} to the 80^{th} percentile of the income distribution relative to total income.

Our work is related to the literature examining the impact of globalisation on income inequality. As noted by Jaumotte et al. (2013), income inequality has risen in most countries over the past two decades. As this period has also been associated with unprecedented trade and financial integration, much of the debate over rising inequality has focused on the role that globalisation—especially of trade—has played in explaining inequality patterns. Some previous studies suggest that globalisation has inequality-increasing effects (Dreher and Gaston, 2008; Bergh and Nilsson, 2010; de Haan and Sturm, 2017). Other studies reach different conclusions. For instance, Jaumotte et al. (2013) find that trade and financial globalization have had opposite effects on income distribution. Trade liberalisation and export growth are found to be associated with lower income inequality, while increased financial openness is associated with higher inequality. Bergh and Nilsson (2014) report that globalisation reduces absolute poverty.

There are several reasons why income inequality may increase in response to globalisation, but they do not necessarily affect the middle class. For instance, inequality may rise because globalisation is mainly benefitting selective income groups (income polarisation). Further, globalisation might decrease poverty rates (Bergh and Nilsson, 2014), but leave the position of the middle- and high-income classes unchanged. On the other hand, Jaumotte et al. (2013) refer to FDI, which is often targeted at high-skilled sectors in the host economy. These authors argue that what appears to be relatively highly skill-intensive inward FDI for a less developed country may appear relatively low skill-intensive outward FDI for the advanced economy. An increase in FDI from advanced to developing countries could thus increase the relative demand for skilled labour in both countries, which may improve the position of the middle class in both the advanced and the developing economy.

To the best of our knowledge, there is no further cross-country study analysing the effects of globalisation on different income fractions of the distribution.[2] To preview our results, we find that

[2] The papers that come closest to our work are Jaumotte et al. (2013) and Dorn et al. (2018) who also analyse

economic globalisation, proxied by the KOF Economic Globalisation Index, reduces the income share of the middle class. However, it turns out that when we distinguish between de facto and de jure measures of globalisation, we find that only de facto measures have statistically significant effects on income shares and inequality measures.

The paper is structured as follows. The next section summarizes previous studies on the position of the middle class. Section 3 describes the data and identifies some stylized facts. Section 4 presents our estimation results for the effect of globalisation on the position of the middle class as well as on the shares of the groups in the tails of the income distribution. Section 5 offers a robustness analysis. The final section concludes.

2. Previous Studies

Why is the position of the middle class important? Simultaneous up- and downward movements from the middle class to both tails of the income distribution could leave overall inequality measures unchanged, but it would increase income polarization. Pressman (2007) argues that income polarization is not desirable as the middle class provides a buffer between the rich and the poor. Furthermore, a strong middle class is considered important for democracy and economic growth (Littrell at al., 2010; Adelman and Morris, 1967) as it is fostering entrepreneurship and human capital formation, heavily influences consumer demand and provides support for market-oriented policies (Ravallion, 2010). Without a middle class, only the rich are educated because the poor are liquidity-constrained and unable to invest in human capital (Galor and Zeira, 1993). As high taxes on the wealthy may be harmful to economic growth due to its diminishing effect on investment (Alesina and Rodrik, 1994 and Persson and Tabellini, 1994), the middle class is also a crucial source for tax collection.

Several earlier studies examine the evolution of the U.S. middle class by providing descriptive time-series analyses of the middle class' income share. For instance, Davis and Huston (1992)

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the impact of globalisation on income inequality. These authors also estimate their model using the income shares of different income groups as dependent variables, but do not focus on the position of the middle class. Jaumotte et al. (2013) find that export growth is associated with a rise in the income shares of the bottom four quintiles and a decrease in the share of the richest quintile. In contrast, financial globalization mainly benefits the richest 20 percent of the population. Dorn et al. (2018) find that globalisation reduces poverty. Bergh and Nilsson (2014) is also closely related to our work. Like Dorn et al. (2018), these authors employ the KOF globalisation index, but focus on the impact of globalisation on poverty (i.e. the percentage of the population living on less than 1$ per day).

explain the decrease of the middle class by rising income shares in the lower and upper segments of the income distribution. The lower segment is increasing its share due to decreases in annual working hours and union membership, whereas the high-income segments increase their share of income due to increased female labour participation (two-income families) and college degrees. In contrast, Rosenthal (1985) finds no evidence of income polarization in the United States. McMahon and Tschetter (1986) compare the study of Rosenthal (1985) and Lawrence (1984) and find that the results depend on whether the middle class is defined in terms of income or occupation. There is clear evidence of polarization if the middle class is defined in terms of personal income, whereas there is no hollowing out of the middle class between 1973 and 1985 if it is based on occupation.

Another approach to analyse the middle class is to consider its size over time. Lawrence (1984) and McMahon and Tschetter (1986) ascribe the hollowing out of the middle class to occupational shifts as well as changes in the earnings distribution within a profession. In contrast, Horrigan and Haugen (1988) attribute the decrease in the size of the middle class to upward mobility, which increases the distance to the low-income fractions. As a consequence, increasing income inequality is due to increased polarization, where middle class families move up, but the income share of the poorest families further deteriorates.

Potential reasons for the decline of the middle class are tax systems and education. Often, the tax system is adversely burdening the middle class as they provide a stable and relatively inelastic tax base. Especially if the rich do not have to pay wealth taxes, the middle class is taxed more compared to other income fractions. The poor fractions of the population receive many benefits in the form of transfers for health and education spending, in contrast to the middle class which usually relies on their own income when investing in education or paying medical bills.

Another potential explanation for a declining middle class has been suggested by Autor et al. (2003; 2006). They claim that computers serve as complements for high-wage jobs but as substitutes for middle-wage jobs, while they have little impact on non-routine manual tasks in low-wage jobs. Relatedly, Levy and Murnane (1992) and Autor et al. (1998) show that technological change leads to a higher demand for high-skilled workers so that middle class occupations are decreasing.[3]

Some studies analyse cross-country differences in income inequality, arguing that globalisation plays a key role in explaining higher inequality. The Stolper-Samuelson theorem states that

[3] In our robustness analysis we control for technology.

increased trade openness reduces income inequality in developing countries, because wages of abundant low-skilled labour increase and compensations of high-skilled workers decrease (Jaumotte et al., 2013). In contrast, high-skilled factors are abundant in developed countries and, thus, are benefitting from trade openness. As a consequence, income inequality in developed countries increases. The results are based on the notion that returns from trade are allotted to the factor that has been used more intensively in production processes. However, the findings in the literature do not confirm the inequality-decreasing effect of trade and capital flows in developing countries. For instance, Figini and Görg (2011) show that increased capital flows, such as foreign direct investment (FDI), increase income inequality in emerging market economies. This can be explained by the nature of FDI which is often targeted at high-skilled sectors (Cragg and Epelbaum, 1996), thereby increasing the demand for skilled labour. In addition, FDI could even be targeted to skill-specific sectors, thereby increasing training as well as wages of already skilled labour. Both developments contribute to increases in income inequality.

Alderson and Nielsen (2002), Kenworthy and Pontusson (2005) and Brady (2009) suggest that inequality differences between countries are associated with differences in labour markets, such as the percentage of agricultural labour force and union density. Dreher and Gaston (2008), de Haan and Sturm (2017) and Dorn et al. (2018) report that globalisation increases income inequality using the KOF Globalisation Index, while Bergh and Nilsson (2010) and Dorn et al. (2018) find that globalisation reduces poverty.[4] Milanovic (2005) analyses the effect of globalisation on relative income shares. His results suggest that the impact of globalisation on inequality depends on the level of economic development. In particular, he finds an increasing effect on inequality in developing, but a decreasing effect in high-income countries. Jaumotte et al. (2013) report that export growth is associated with a rise in the income shares of the bottom four quintiles and a decrease in the share of the richest quintile. In contrast, financial globalization mainly benefits the richest 20 percent of the population. Dabla-Norris et al. (2015) find that trade openness has no effect on the Gini-coefficient, whereas financial openness and technological progress lead to more inequality.

[4] Potrafke (2015) provides a comprehensive survey of the evidence on the effects of globalisation on income inequality.

3. Data and Empirical Model

3.1 Data

The middle-class measures are constructed using data of the Global Consumption and Income Project (GCIP)[5], which generates the Global Consumption Dataset (GCD) and the Global Income Dataset (GID). These datasets provide estimates of the incomes of different quantiles of the population for more than 150 countries between 1960 and 2015. The data is collected from various sources. Lahoti et al. (2016) standardized the data and used extra- and interpolation to fill gaps.

In order to analyse middle-class dynamics, we need an adequate measure of the middle class. A very common definition is to take the middle 60% of the income, thereby generating a middle class that ranges from the 20th to the 80th percentile (Atkinson and Brandolini, 2011; Easterly, 2001). We follow this literature and construct the middle class' income share relative to total income. In particular:

$$\text{Middle } 60\% = \frac{\text{Middle Class Income Share}}{\text{Total Income}} = \frac{\sum_{i=1}^{8} \text{share}_i - \sum_{i=1}^{2} \text{share}_i}{1}$$

In a second part, we want to analyse how the middle class performs compared to the bottom 20%. Therefore, we divide the middle-class income share by the combined income of the middle class and the bottom 20%, as illustrated in the following equation:

$$\text{Middle} = \frac{\text{Middle Class Income Share}}{\text{Middle Class Income Share} + \text{Low Income Share}} = \frac{\sum_{i=1}^{8} \text{share}_i - \sum_{i=1}^{2} \text{share}_i}{\sum_{i=1}^{8} \text{share}_i}$$

For the Gini-coefficients, we use Solt's (2016) Standardized World Income Inequality Database (SWIID), which provides market-based (pre-tax) and net (after-tax) income inequality data for 191 countries from 1960 to 2016. The advantage of using this source is its distinction between market-based and net Gini-coefficients. Market-based Gini-coefficients capture inequality levels resulting from market processes. In contrast, net Gini coefficients incorporate redistribution measures implemented by governments through taxes and transfers. Distinctive government policies across countries lead to a large variation in the difference between these two measures. As a consequence, the market-based Gini-coefficients have generally higher values than net Gini-coefficients (see Table 1).

[5] See http://gcip.info.

We use the KOF Index of Globalisation as developed by Dreher (2006) and recently revised by Gygli et al. (2019) as proxy for globalisation (cf. de Haan and Sturm, 2017 and Dorn et al., 2018). The index is published annually by the KOF Swiss Economic Institute and includes data for 209 countries from 1970 to 2015. There are three main components of globalisation described by the index, namely political, social and economic globalisation. In our analysis, we focus on the economic globalisation component. By using economic globalisation, we follow previous studies, such as Feenstra and Hanson (1996) and Sturm and de Haan (2015). The economic component includes variables such as trade (as a percentage of GDP), foreign direct investment and import barriers. The revised KOF index distinguishes between *de facto* and *de jure* measures of globalisation. De facto measures, such as foreign direct investments and international trade, describe actual cross-border flows. In contrast, de jure measures, such as trade regulation and tariffs, aim at capturing conditions that influence international transactions.

Table 1: Summary Statistics

Variable	N	Mean	SD	Median	Min	Max
Gini coefficient based on household market income	828	45.66	6.51	45.28	23.92	68.07
Gini coefficient based on disposable household income	828	37.95	8.7	37.83	19.49	59.34
Middle 60% Share	828	42.73	8.48	42.63	18.2	57.17
Middle Share (No Top)	828	90.22	2.94	90.55	80.73	97.21
Bottom 20% Share	828	4.96	2.47	4.37	0.58	12.48
Bottom Share (No Top)	828	9.78	2.94	9.45	2.79	19.27
Top 20% Share	828	52.31	10.81	52.8	31.53	81.07
Bottom 10% Share	828	1.91	1.12	1.64	0.13	5.95
Top 10% Share	828	37.09	10.85	37.01	18.14	69.55
KOF Economic Globalisation Index	828	51.9	17.51	50.71	11.72	93.15
KOF Economic Globalisation Index, de facto	828	50.35	19.57	49.77	6.91	98.24
KOF Economic Globalisation Index, de jure	828	53.44	21.39	50.76	12.99	95.98
KOF Trade Globalisation Index, de facto	828	47.16	21.42	46.21	6.73	98.36
KOF Trade Globalisation Index, de jure	819	54	23.59	50.26	8.28	98.04
KOF Financial Globalisation Index, de facto	828	53.54	21.52	52.06	6.42	99.43
KOF Financial Globalisation Index, de jure	828	53.09	24.24	56.76	5.05	94.57
Human capital index	828	2.34	0.7	2.34	1.04	3.72
log GDP per capita	828	8.87	1.19	8.99	5.96	11.41
Largest government party is left-wing	828	0.32	0.42	0	0	1

*Note*s: At most 132 countries are covered in nine 5-year periods from 1970 to 2014.

In total, we cover 132 countries for the period 1970-2014 in 5-year averages. In contrast to most previous studies like Jaumotte et al. (2013) and Dorn et al. (2018), we use five-year non-overlapping averages for three reasons (see also Dabla-Norris et al., 2015 and de Haan and Sturm, 2017). In the first place, annual macroeconomic data are noisy, and this applies especially for data on income inequality (Delis et al., 2014). In the second place, the GCIP data are imputed for years

for which no information is available in the underlying databases, which applies particularly for countries in Africa, Latin America, and Asia. In addition, income inequality is a slowly moving variable and, therefore, has only limited annual variation. Finally, we are interested in the long-term effects of globalisation and not in short-term, i.e. business cycle driven, effects.

Figure A.1 shows the histograms of four key variables, namely the middle class' income share to total income, the income shares of the top and bottom 20% as well as the KOF Economic Globalisation Index. The histograms are partitioned into three time periods (1970-1984, 1985-1999 and 2000-2014) in order to depict the changes in the distribution over time. Whereas economic globalisation comes close to being normally distributed in all three time periods, the income-share measures of the middle 60% and the top 20% exhibit two to three peaks. The distribution of the bottom 20% experienced a downward trend in income shares in the three time periods.

3.2 Model

The empirical model used has the following basic structure:

$$M_{i,t} = \alpha_2 Glob_{i,t} + \alpha_3 X_{i,t} + \alpha_i + \alpha_t + e_{i,t},$$

where $M_{i,t}$ denotes the measures for the middle-class income share and $Glob_{i,t}$ is economic globalisation and its de facto and de jure components. $X_{i,t}$ contains the control variables, namely the log of GDP per capita, a human capital index and a dummy reflecting whether the largest government party is left-wing. Furthermore, country- and time-fixed effects are used. The log of real GDP per capita accounts for any effects driven by economic development (Wade, 2004; Bergh and Nilsson, 2014). Data on real GDP is provided by the Penn World Table (PWT) as constructed by Feenstra et al. (2015). It provides data on real GDP, using prices for final goods that are constant across countries as well as over time and are measured in 2005 US$. We combine the data on GDP and population to construct log real GDP per capita. Furthermore, we include the human capital index, which is also provided by the PWT. The human capital index is based on the average years of schooling and an assumed rate of return to education, based on Mincer equation estimates around the world that evaluate the average monetary return of one additional year of education.[6] Alternative measures include the population share with secondary education or using solely the average years of education (both used in Jaumotte et al., 2013). Incomes and, hence, income

[6] These measures are deduced from various sources. For a detailed description refer to https://www.rug.nl/ggdc/docs/human_capital_in_pwt_90.pdf, accessed October 21, 2019.

inequality as well as income shares are to a large part determined by education levels. In addition, a higher level of the human capital index generally suggests a higher level of education in the middle class. This has potentially important ramifications for the effects of globalisation on the income shares. As noted above, globalisation leads to shifts in occupational needs. A country with more human capital is more likely to adapt to potential changes imposed by worldwide globalisation. In order to control for these mechanisms, we include a variable capturing human capital in a country. Further, we add a dummy on whether the largest government party is left-wing as a control variable. In general, left-wing governments are more likely to introduce policies that increase benefits of the less fortunate, whereas right-wing governments are more willing to reduce the tax burden of high-income households (Hibbs, 1977). The former is contributing to less income inequality and higher income shares of the poor and potentially the middle class. The level of redistribution is likely to have an impact on the way costs and benefits from globalisation are allotted to different income fractions. The Database of Political Institutions (DPI), constructed by Cruz and Scartascini, (2016), provides data on political alignment of the major political parties. Thus, we control for education and the political alignment of the largest government party to circumvent potential endogeneity issues. In the sensitivity analysis, we include more controls (such as the unemployment rate and age dependency) to check whether our results are robust.

4. Results: The Effects of Economic Globalisation

The main results are shown in Tables 2-5. In order to compare our findings with the outcomes of previous studies, we first examine the impact of economic globalisation on the Gini-coefficient. Table 2 presents the estimation results. We estimate the effects on the gross (market-based) Gini-coefficient (columns 1-4) as well as the net (after-tax) Gini-coefficient (column 5-8). Economic globalisation has a significantly positive effect on both market and net Gini coefficients. Thus, economic globalisation is on average increasing income inequality.[7] This result is consistent with the findings reported by previous studies such as Dreher and Gaston (2008), Bergh and Nilsson

[7] There is an extensive literature on the consequences of more income inequality. Several papers provide evidence that inequality may reduce the pace and durability of growth (see, for instance, Persson and Tabellini, 1994; Berg et al., 2012; and Ostry et al., 2014). To the extent that economies are periodically subject to economic shocks that limit growth in the short term, greater income inequality makes a larger proportion of the population vulnerable to poverty (Jaumotte et al., 2013). Inequality may also have political consequences. Agnello et al. (2017) show, for instance, that a rise in inequality increases the probability of government crises.

(2010), de Haan and Sturm (2017) and Dorn et al. (2018). Furthermore, our results suggest that the effect is driven by de facto measures of globalisation as the coefficients on de jure measure of globalisation are not significant, both in the model for the gross Gini coefficient (column 4) and the net Gini coefficient (column 8). In addition, the effects of globalisation on market-based Gini-coefficients are larger than those on net Gini coefficients. This suggests that governments initiate redistribution and thereby countervail to some degree the inequality-increasing effects of globalisation.

Table 2: The Effect of Globalisation on Gini-Coefficients

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Gini_Market	Gini_Market	Gini_Market	Gini_Market	Gini_Net	Gini_Net	Gini_Net	Gini_Net
VARIABLES	Baseline	KOFEcGI	KOFEcGIdf	KOFEcGIdj	Baseline	KOFEcGI	KOFEcGIdf	KOFEcGIdj
log GDP per capita	2.596***	2.312***	2.582***	2.451***	2.176**	1.978**	2.167**	2.015**
	(2.839)	(2.689)	(3.025)	(2.656)	(2.374)	(2.257)	(2.466)	(2.149)
Human capital index	-4.175**	-4.128**	-4.016**	-4.222**	-2.832*	-2.800*	-2.736*	-2.884*
	(-2.348)	(-2.345)	(-2.333)	(-2.370)	(-1.767)	(-1.739)	(-1.729)	(-1.789)
Largest government party is left-wing	-0.622*	-0.554	-0.592*	-0.599	-0.489	-0.442	-0.471	-0.463
	(-1.711)	(-1.549)	(-1.677)	(-1.637)	(-1.562)	(-1.424)	(-1.532)	(-1.469)
KOF Economic Globalisation Index		0.0977***				0.0682**		
		(3.061)				(2.376)		
KOF Economic Globalisation Index, de facto			0.0736***				0.0445**	
			(3.540)				(2.310)	
KOF Economic Globalisation Index, de jure				0.0259				0.0287
				(0.941)				(1.266)
Adjusted R-squared	0.192	0.225	0.233	0.194	0.086	0.109	0.107	0.092
Number of observations	828	828	828	828	828	828	828	828
Number of countries	132	132	132	132	132	132	132	132
Number of periods	9	9	9	9	9	9	9	9
F-test period-fixed effects	7.42e-07	1.17e-05	3.51e-06	3.62e-06	2.16e-05	5.13e-05	2.49e-05	9.12e-05

Notes: Table shows the effects of economic globalisation variables on market-based as well as after-tax Gini-coefficients using the fixed-effects model. The respective Gini measure is depicted in the top row. The second row denotes the included globalisation variable. *KOFEcGI* denotes the aggregate KOF Economic Globalisation Index, *KOFEcGIdf* the de facto KOF Economic Globalisation Index and *KOFEcGIdj* is the de jure KOF Economic Globalisation Index. The baseline model includes no globalisation variable. Standard errors are clustered at the country level. *** p<0.01, ** p<0.05, * p<0.1. Robust t-statistics in parentheses. Country- and period-fixed effects are not shown.

Another interesting result is the consistently negative effect of the human capital index on Gini-coefficients. This means that a higher education level leads to a decrease in income inequality. This finding, which is in line with the results of previous studies such as Coady and Dizioli (2017), is not surprising. As more and more people are educated up to the tertiary level, the income differences between the top and the general population decline. Formerly, only very wealthy households could afford education, but with government policies and a shift in society to more equality of opportunity the tendency to get educated increased over the last decades.

As for the other control variables, log GDP per capita is always statistically significant and positive, thus, with economic development inequality levels increase in a country. One reason could be the

higher variation in incomes in advanced economies, since they are still having agricultural and industrial professions but also highly paid office jobs in the service sector. In contrast, the variable on the political alignment of the largest government party is only statistically significant for some market-based measures.

The results reported in Table 2 are unable to explain the underlying mechanisms inherent in the changes of income inequality. In order to understand the mechanisms further, we analyse the effects on income shares of different fractions of the population. In particular, we estimate the effects on the income share of the middle class as well as on income shares of the lowest and highest deciles. Our hypothesis is that these percentiles are affected differently in response to globalisation. Thus, we offer a more comprehensive analysis of the effects by pinpointing the benefiters and losers of globalisation within the income distribution.

Table 3: The Effects of Globalisation on Middle Class Income Shares

	(1)	(2)	(3)	(4)
	Middle 60%	Middle 60%	Middle 60%	Middle 60%
VARIABLES	Baseline	KOFEcGI	KOFEcGIdf	KOFEcGIdj
log GDP per capita	-0.556	-0.407	-0.546	-0.563
	(-0.684)	(-0.521)	(-0.711)	(-0.675)
Human capital index	2.831	2.807	2.727	2.829
	(1.601)	(1.602)	(1.578)	(1.606)
Largest government party is left-wing	0.218	0.183	0.199	0.220
	(0.587)	(0.498)	(0.557)	(0.582)
KOF Economic Globalisation Index		-0.0512*		
		(-1.925)		
KOF Economic Globalisation Index, de facto			-0.0484**	
			(-2.406)	
KOF Economic Globalisation Index, de jure				0.00138
				(0.0686)
Adjusted R-squared	0.058	0.070	0.082	0.056
Number of observations	828	828	828	828
Number of countries	132	132	132	132
Number of periods	9	9	9	9
F-test period-fixed effects	2.42e-05	0.000288	7.76e-05	0.000119

Notes: Table shows the effects of economic globalisation variables on the middle class' income share using the fixed-effect model. *Mid2Total* contains the middle's income share relative to total income using the 20^{th} to 80^{th} percentile as the middle-class income range. The second row denotes the included globalisation variable (see notes to Table 2). The baseline model includes no globalisation variable. Standard errors are clustered at the country level. *** p<0.01, ** p<0.05, * p<0.1. Robust t-statistics in parentheses. Country- and period-fixed effects are not shown.

Table 3 presents the results of the effect of globalisation on the middle-class income share. In general, our findings suggest that globalisation has a decreasing effect on the income share of the middle class. In line with the results in Table 2, we find that the effects are statistically significant for aggregate economic globalisation as well as for the de facto measure of globalisation, whereas the coefficient on de jure economic globalisation is not significant. A one standard deviation

increase in economic globalisation leads to an almost one unit (-0.89) decrease in the middle-class income share. For the de facto economic globalisation, the decrease is even closer to 1 unit (-0.96).

In contrast to our findings for the models for the Gini-coefficients, the effect of the human capital index is positive but insignificant. This result is unexpected given that increasing education levels are mainly driven by increased investment in education by the middle class. However, the insignificant result can be explained by the large range of the middle-class definition. In particular, the range spans from the 20th to the 80th percentile, but additional education is mainly experienced in the upper middle-income section. As a consequence, the overall average effect is non-significant. The political orientation of the largest government party also seems to be irrelevant in this setup. As suggested in the literature section of this paper, the middle class is not a recipient of social benefits. In addition, left-wing parties target redistribution from the top to the bottom, leaving the middle class mainly unchanged.

Table 4: The Effects of Globalisation on Tail Income Shares

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Bottom 20%	Bottom 20%	Bottom 20%	Bottom 20%	Top 20%	Top 20%	Top 20%	Top 20%
VARIABLES	Baseline	KOFEcGI	KOFEcGIdf	KOFEcGIdj	Baseline	KOFEcGI	KOFEcGIdf	KOFEcGIdj
log GDP per capita	-0.188	-0.126	-0.185	-0.156	0.744	0.533	0.731	0.719
	(-0.700)	(-0.479)	(-0.717)	(-0.557)	(0.709)	(0.527)	(0.736)	(0.664)
Human capital index	-0.0392	-0.0494	-0.0729	-0.0289	-2.792	-2.757	-2.654	-2.800
	(-0.0649)	(-0.0815)	(-0.121)	(-0.0480)	(-1.261)	(-1.255)	(-1.221)	(-1.271)
Largest government party is left-wing	0.258**	0.243**	0.252**	0.253**	-0.476	-0.426	-0.450	-0.472
	(2.292)	(2.240)	(2.372)	(2.247)	(-1.040)	(-0.948)	(-1.036)	(-1.019)
KOF Economic Globalisation Index		-0.0213**				0.0725**		
		(-2.160)				(2.137)		
KOF Economic Globalisation Index, de facto			-0.0156**				0.0640**	
			(-2.576)				(2.569)	
KOF Economic Globalisation Index, de jure				-0.00575				0.00437
				(-0.669)				(0.165)
Adjusted R-squared	0.101	0.116	0.118	0.102	0.062	0.077	0.088	0.061
Number of observations	828	828	828	828	828	828	828	828
Number of countries	132	132	132	132	132	132	132	132
Number of periods	9	9	9	9	9	9	9	9
F-test period-fixed effects	4.70e-06	0.000197	1.64e-05	0.000167	9.35e-06	0.000189	3.34e-05	0.000102

Notes: Table shows the effects of economic globalisation variables on the lowest (*Bottom 20%*) and highest (*Top 20%*) two deciles' income shares using the fixed-effect model. The respective shares are depicted in the top row. The second row denotes the included globalisation variable (see notes to Table 2). The baseline model includes no globalisation variable. Standard errors are clustered at the country level. *** p<0.01, ** p<0.05, * p<0.1. Robust t-statistics in parentheses. Country- and period-fixed effects are not shown.

In order to gain a complete picture of the fractions of the population that benefit and lose from globalisation, we estimate the same model on tail income shares. Table 4 provides the results. For the low income share deciles, economic and de facto (but not de jure) economic globalisation have a significantly negative effect at the 5% significance level. Similar to the effects of globalisation on the income shares of the middle class, globalisation is decreasing the income share of the bottom

20%, although the effects are lower in magnitude. In addition, having a large left government party increases the income share of this decile, whereas an increase in the human capital index does not have a significant impact on their income share. This may reflect that a high level of education is rather uncommon for the lower fractions of the population.

The results are very different for the income share of the richest 20%. Aggregate economic as well as de facto economic (but not de jure) globalisation have significantly positive effects on the income shares of the top 20%. In other words, globalisation increases the income share of the already wealthy fraction of the population.[8] The coefficient on human capital is not statistically significant, as in the regressions for the bottom 20%. Similar to the results for the middle class, the political orientation of the largest party has no significant impact on the income shares of the top 20% suggesting that the tax burden imposed by left-wing parties is not profound enough to appear in the results.

In sum, the income share of the middle class is declining. The results suggest that globalisation is solely increasing the income shares of the top 20%. In contrast, the income shares of the low-income and middle-income groups decline. As a consequence, income inequality is increasing in response to globalisation, as suggested in Table 2. However, the described results do not conclusively determine whether the middle class is the most affected income group. Previous studies suggest that computers and other technological advances have negative effects on middle income jobs, but no effect on employment and wages in the low-income fraction. In order to test this hypothesis, we estimate the effects of globalisation on middle and low-income shares, where shares are defined not by total income but the combined income shares of the bottom 20% and the middle 60%. The results are provided in Table 5.

In contrast to the computerisation argument, the effect of globalisation is stronger for the bottom 20%. In particular, the results in Table 5 show that the transformed income share of the middle class is increasing, whereas the bottom 20%'s share is decreasing. Similar to the previous results, the effects are only statistically significant for the aggregate and the de facto economic globalisation measures. Thus, even though both income shares decrease when measured by total income, the findings in Table 5 demonstrate that the low-income group is more affected by globalisation.

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[8] This result is further strengthened by the even stronger effects on the top 10% income share, see Table A.1. Thus, the top 10% benefit the most from globalisation. In contrast, the effect on the bottom 10% is weaker than for the bottom 20%, suggesting that the second decile (10^{th}-20^{th} percentiles) is losing relatively more due to globalisation.

Table 5: The Effects of Globalisation on Middle- and Low-Income Shares (No Top Income).

VARIABLES	(1) Middle (No Top) KOFEcGI	(2) Middle (No Top) KOFEcGIdf	(3) Middle (No Top) KOFEcGIdj	(4) Bottom (No Top) KOFEcGI	(5) Bottom (No Top) KOFEcGIdf	(6) Bottom (No Top) KOFEcGIdj
log GDP per capita	0.270	0.341	0.296	-0.270	-0.341	-0.296
	(0.695)	(0.880)	(0.717)	(-0.695)	(-0.880)	(-0.717)
Human capital index	0.660	0.685	0.632	-0.660	-0.685	-0.632
	(0.703)	(0.734)	(0.681)	(-0.703)	(-0.734)	(-0.681)
Largest government party is left-wing	-0.241	-0.252*	-0.251	0.241	0.252*	0.251
	(-1.585)	(-1.674)	(-1.617)	(1.585)	(1.674)	(1.617)
KOF Economic Globalisation Index	0.0254*			-0.0254*		
	(1.927)			(-1.927)		
KOF Economic Globalisation Index, de facto		0.0173**			-0.0173**	
		(2.092)			(-2.092)	
KOF Economic Globalisation Index, de jure			0.00865			-0.00865
			(0.749)			(-0.749)
Adjusted R-squared	0.104	0.104	0.095	0.104	0.104	0.095
Number of observations	828	828	828	828	828	828
Number of countries	132	132	132	132	132	132
Number of periods	9	9	9	9	9	9
F-test period-fixed effects	0.000847	0.000142	0.000751	0.000847	0.000142	0.000751

Notes: Table shows the effects of economic globalisation variables on the middle class' and on the lowest (Bottom 20%) two deciles' income shares of their combined income using the fixed-effect model (top incomes are excluded from total income). The respective shares are depicted in the top row. The second row denotes the included globalisation variable (see notes to Table 2). The baseline model includes no globalisation variable. Standard errors are clustered at the country level. *** p<0.01, ** p<0.05, * p<0.1. Robust t-statistics in parentheses. Country- and period-fixed effects are not shown.

5. Robustness Checks

5.1 Additional Controls

Table 6 shows the results for our regressions for the middle-class income share if we add several controls to the model shown in Table 3.[9] One potential concern is that technological progress rather than globalisation is driving the results. This notion is related to Autor et al.'s (2003; 2006) argument of technological progress leading to a declining middle class. Therefore, we first add the share of ICT capital in the total capital stock following Jaumotte et al. (2013) who argue that this is a reasonable proxy for technology. Next, we add inflation (see also Bergh and Nilsson, 2014). There is some literature suggesting that inflation especially hurts the poor (see Colciago et al., 2019 for a discussion). The third additional control variable is democracy (cf. Bergh and Nilsson, 2014).

[9] Summary statistics and sources of the additional variables are provided in Table A.2 in the Appendix.

Table 6: Additional Controls

VARIABLES	(1) Middle 60% KOFEcGIdf	(2) Middle 60% KOFEcGIdf	(3) Middle 60% KOFEcGIdf	(4) Middle 60% KOFEcGIdf	(5) Middle 60% KOFEcGIdf	(6) Middle 60% KOFEcGIdf	(7) Middle 60% KOFEcGIdf
log GDP per capita	1.035	-0.505	-0.531	-0.0606	-0.554	-0.547	0.437
	(1.558)	(-0.676)	(-0.699)	(-0.0740)	(-0.740)	(-0.711)	(0.568)
Human capital index	1.487	3.789**	2.745	3.724*	2.350	2.730	2.096
	(0.637)	(2.000)	(1.580)	(1.896)	(1.332)	(1.574)	(1.049)
Largest government party is left-wing	0.234	0.207	0.212	0.0944	0.156	0.198	0.433
	(0.524)	(0.581)	(0.600)	(0.244)	(0.432)	(0.556)	(1.072)
KOF Economic Globalisation Index, de facto	-0.0590***	-0.0536***	-0.0505**	-0.0535**	-0.0504**	-0.0485**	-0.0480**
	(-3.279)	(-2.660)	(-2.451)	(-2.308)	(-2.543)	(-2.397)	(-2.383)
ICT capital stock share	-7.416						
	(-0.776)						
Inflation rate		-0.00236					
		(-0.133)					
Democracy			0.0369				
			(0.854)				
Agriculture, value added (% of GDP)				0.137***			
				(3.159)			
Total natural resources rents (% of GDP)					0.0346		
					(1.405)		
Age dependency ratio (% of working-age population)						0.0428*	
						(1.730)	
Total unemployment (% of total labor force)							-0.0231
							(-0.510)
Adjusted R-squared	0.122	0.092	0.085	0.148	0.084	0.081	0.122
Number of observations	605	828	828	706	797	828	637
Number of countries	132	132	132	127	126	132	110
Number of periods	5	9	9	9	9	9	7
F-test period-fixed effects	0.00627	0.000120	6.68e-05	0.000151	9.96e-05	9.03e-05	4.55e-05

Notes: Table shows the robustness of the effects of de facto economic globalisation variables on the middle-class income share when including additional control variables. *Mid2Total* contains the middle's income share relative to total income using the 20th to 80th share as the middle-class income range. Standard errors are clustered at the country level. *** p<0.01, ** p<0.05, * p<0.1. Robust t-statistics in parentheses. Country- and period-fixed effects are not shown.

For democracy, we use the Polity index of democracy that ranges from -10 (hereditary monarchy) to +10 (consolidated democracy). Including democracy controls for the possibility that democracies may be more likely to distribute potential benefits stemming from globalisation across the population. The next controls added are agriculture (cf. Jaumotte et al., 2013), natural resource rents and the age dependency ratio. Agrarian economies are less likely to have high levels of globalisation. Our data suggests a correlation of -0.52 between the size of the agricultural sector and de facto economic globalisation. Scognamillo et al. (2016) provide evidence that natural resource dependence is, on average, negatively correlated with the Gini index. However, they also suggest that the effect differs between high- and low-income countries. In low-income countries, the probability that income is distributed unevenly is higher. A higher level of globalisation adds further possibilities for augmenting existing income and wealth, thereby increasing inequality and potentially reducing the middle class' income share. The theoretical model of Chen et al. (2017) predicts that population ageing increases income inequality. Their empirical evidence for China

confirms this. Finally, we include unemployment. The fact that unemployment raises inequality is well documented in the literature (Cysne, 2009).

The coefficients on most additional controls turn out to be insignificant, except for those on agriculture and age dependency. The most important conclusion that follows from Table 6 is that our main finding that globalisation reduces the income share of the middle class remains intact.

5.2 Alternative Cut-offs for the Middle Class

The previous sections relied on middle class incomes being defined in the range between the 20th and 80th percentile. However, in the literature alternative definitions have been used. Therefore, this robustness check provides results using alternative cut-offs for the definition of the middle class. In particular, we show results where middle income is defined within the range of the 30th and 80th percentile as well as the 30th and 90th percentile. Table 7 shows the results.

Table 7: Alternative Cut-offs for Middle Class Income Shares

	(1)	(2)	(3)	(4)	(5)	(6)
	Mid2Total38	Mid2Total38	Mid2Total38	Mid2Total39	Mid2Total39	Mid2Total39
VARIABLES	KOFEcGI	KOFEcGIdf	KOFEcGIdj	KOFEcGI	KOFEcGIdf	KOFEcGIdj
log GDP per capita	-0.315	-0.430	-0.452	-0.0511	-0.185	-0.200
	(-0.488)	(-0.677)	(-0.655)	(-0.0772)	(-0.283)	(-0.282)
Human capital index	2.482*	2.414	2.498*	2.598	2.522	2.619
	(1.667)	(1.645)	(1.665)	(1.589)	(1.564)	(1.577)
Largest government party is left-wing	0.0854	0.0981	0.117	-0.0619	-0.0467	-0.0271
	(0.268)	(0.317)	(0.358)	(-0.164)	(-0.126)	(-0.0706)
KOF Economic Globalisation Index	-0.0422*			-0.0490*		
	(-1.880)			(-1.923)		
KOF Economic Globalisation Index, de facto		-0.0409**			-0.0460**	
		(-2.400)			(-2.426)	
KOF Economic Globalisation Index, de jure			0.00250			0.00111
			(0.148)			(0.0596)
Adjusted R-squared	0.068	0.081	0.055	0.065	0.078	0.050
Number of observations	828	828	828	828	828	828
Number of countries	132	132	132	132	132	132
Number of periods	9	9	9	9	9	9
F-test period-fixed effects	0.000443	0.000139	0.000152	0.00250	0.000864	0.000552

Notes: Table shows the effects of economic globalisation variables on the middle class' income share using the fixed-effect model. Middle class is defined using the 30th to 80th or 30th to 90th percentiles (designated by *38* or *39* at the end of the variable name in the second top row). The second row denotes the included globalisation variable (see notes to Table 2). Standard errors are clustered at the country level. *** p<0.01, ** p<0.05, * p<0.1. Robust t-statistics in parentheses. Country- and period-fixed effects are not shown.

In sum, the previous results are confirmed using alternative cut-offs for middle class income. However, using a smaller range (30th to 80th) yields overall smaller effects of globalisation on middle income shares. This result implies that incomes between the 20th and 30th percentile (3th

decile share) are important contributors to the decline of the middle income share in the 20th to 80th percentile definition. Using a similarly large but higher range (30th to 90th) yields smaller effects, showing that middle class income shares are declining less when middle income is defined by higher incomes. Surprisingly, the effect is larger than for the 30th to 80th percentile definition of middle income. This finding suggests that there may be non-linearities in income shares as the income shares of the incomes between the 80th and 90th percentile (9th decile share) decline relatively more than the shares including incomes between the 30th and 80th percentile.

5.3 Heterogeneity: Trade and Financial Globalisation

The KOF Economic Globalisation Index can be partitioned into a trade and a financial component. The results for trade and financial globalisation are shown in Table 8. First, in line with the aggregate measure of de facto economic globalisation, both subcomponents have negative effects on the income shares of the middle class. Thus, the previous results are confirmed using the subcomponents. Both financial and trade globalisation are contributing to the negative effect of de facto economic globalisation.

Table 8: Effects of Trade and Financial Globalisation on Middle Class Income Shares

	(1)	(2)	(3)	(4)
	Middle 60%	Middle 60%	Middle 60%	Middle 60%
VARIABLES	KOFTrGIdf	KOFTrGIdj	KOFFiGIdf	KOFFiGIdj
log GDP per capita	-0.659	-0.566	-0.471	-0.567
	(-0.838)	(-0.698)	(-0.597)	(-0.676)
Human capital index	2.968*	2.944	2.613	2.822
	(1.692)	(1.642)	(1.498)	(1.612)
Largest government party is left-wing	0.223	0.249	0.191	0.221
	(0.610)	(0.650)	(0.532)	(0.588)
KOF Trade Globalisation Index, de facto	-0.0396*			
	(-1.962)			
KOF Trade Globalisation Index, de jure		0.00166		
		(0.0898)		
KOF Financial Globalisation Index, de facto			-0.0284**	
			(-2.207)	
KOF Financial Globalisation Index, de jure				0.00208
				(0.143)
Adjusted R-squared	0.077	0.058	0.072	0.057
Number of observations	828	819	828	828
Number of countries	132	130	132	132
Number of periods	9	9	9	9
F-test period-fixed effects	4.60e-05	4.55e-05	5.70e-05	0.000109

Notes: Table shows the effects of trade and financial globalisation variables on middle class income share using the fixed-effect model. *Mid2Total* contains the middle's income share relative to total income using the 20th to 80th percentile as the middle-class income range. The second row denotes the included globalisation variable (see notes to Table 2). The baseline model includes no globalisation variable. Standard errors are clustered at the country level. *** p<0.01, ** p<0.05, * p<0.1. Robust t-statistics in parentheses. Country- and period-fixed effects are not shown.

5.4 Results for Country Income Groups

Table 9 shows the results for our baseline model for three country groups: high-income, middle income and low-income countries. Middle-income countries include all countries that are classified as "Upper Middle Income" by the World Bank. Low-income countries include "Lower Middle Income" and "Low Income" countries (the combination was required due to data shortage). The results suggest that economic globalisation does not have a significant effect on the income share of the middle class in high-income countries, but the coefficient on the KOF-index is significant in middle- and low-income countries. Interestingly, the strongest effects are found for the middle-income countries. In general, high income countries exhibit, on average, high globalisation levels already at the beginning of the sample period. Therefore, additional increases in globalisation levels are likely to have a weaker effect on income shares and inequality.

Table 9: Effect of de facto Globalisation on Middle Class Measures by Income Group

	(1)	(2)	(3)	(4)	(5)	(6)
	Middle 60%	Middle 60%	Middle 60%	Middle 60%	Middle 60%	Middle 60%
VARIABLES	Baseline	KOFEcGIdf	Baseline	KOFEcGIdf	Baseline	KOFEcGIdf
log GDP per capita	0.206	0.252	-1.328	-0.840	0.371	0.0960
	(0.183)	(0.218)	(-0.524)	(-0.375)	(0.338)	(0.0877)
Human capital index	4.177*	4.243*	6.713*	6.142	-3.082	-2.390
	(1.939)	(1.953)	(1.792)	(1.653)	(-0.856)	(-0.665)
Largest government party is left-wing	0.392	0.405	1.609**	1.326**	-0.722	-0.619
	(1.459)	(1.489)	(2.098)	(2.060)	(-0.859)	(-0.736)
KOF Economic Globalisation Index, de facto		0.0149		-0.0852**		-0.0620*
		(0.520)		(-2.692)		(-1.749)
Adjusted R-squared	0.143	0.143	0.136	0.190	0.039	0.078
Income Sample	High	High	Middle	Middle	Low	Low
Number of observations	330	330	204	204	294	294
Number of countries	44	44	33	33	55	55
Number of periods	9	9	9	9	9	9
F-test period-fixed effects	0.00328	0.00584	0.00529	0.0259	0.0165	0.0311

Notes: Table shows the effects of de facto economic globalisation on the middle-class income share for different country income groups. *Mid2Total* contains the middle's income share relative to total income using the 20^{th} to 80^{th} percentile as the middle-class income range. The second row denotes the included globalisation variable. *Income Sample* denotes the income group included. *High* estimates the effects of de facto economic globalisation for high-income countries. *Middle* includes all countries that are classified as "Upper Middle Income" by the World Bank. *Low* denotes "Lower Middle Income" and "Low Income" countries (the combination was required due to data shortage). Standard errors are clustered at the country level. *** p<0.01, ** p<0.05, * p<0.1. Robust t-statistics in parentheses. Country- and period-fixed effects are not shown.

6. Discussion and Conclusion

The main finding of this paper suggests that the income share of the middle class is decreasing in response to economic globalisation. The same applies for the income share of the lowest fraction of the income distribution. In addition, the results comparing the income share decrease of the lowest fraction with the decrease of the middle class yield a stronger negative effect on the bottom income share. The declining income shares are absorbed by the highest income fraction, as their income share is increasing with increased globalisation levels. The results are robust using the trade and financial subcomponents of economic globalisation as well as alternative cut-offs for the middle-class measures. However, our results are driven by the effect of globalisation in middle income and low-income countries; for high-income countries we do not find evidence that economic globalisation affects the income share of the middle class.

One caveat is in order. Analysing the income shares does not provide a full depiction of the underlying mechanisms. In order to fully understand the up- and downgrading along the income distribution, we have to understand the changes in the size of the middle class as well as income mobility across income groups. However, this analysis is only feasible with adequate survey data. Therefore, we leave this for future research.

Another interesting issue for future research is to link our findings to research on popular support for globalisation. Although support for globalisation in different countries has been investigated,[10] it would be interesting to examine this relationship for different income percentiles in these countries. Our results suggest that the middle class in low- and especially middle-income countries may not support globalisation.

[10] See, e.g. research by the Pew Research Center reported here: https://www.pewresearch.org/global/2014/09/16/faith-and-skepticism-about-trade-foreign-investment/, accessed October 23, 2019.

References

Adelman, I., and Morris, C.T., 1967. Society, Politics and Economic Development: A Quantitative Approach. John Hopkins, Baltimore.

Alderson, A. S., and Nielsen, F., 2002. Globalization and the great U-turn: Income inequality trends in 16 OECD countries. American Journal of Sociology, 107(5), 1244-1299.

Alderson, A. S., Beckfield, J., and Nielsen, F., 2005. Exactly how has income inequality changed? Patterns of distributional change in core societies. International Journal of Comparative Sociology, 46(5-6), 405-423.

Alesina, A., and Rodrik, D., 1994. Distributive politics and economic growth. The Quarterly Journal of Economics, 109(2), 465-490.

Atkinson, A.B., and Brandolini, A., 2011. On the identification of the "Middle Class". ECINE Working Paper Series, 217.

Autor, D. H., Katz, L. F., and Krueger, A. B., 1998. Computing inequality: Have computers changed the labor market? The Quarterly Journal of Economics, 113(4), 1169-1213.

Autor, D. H., Levy, F., and Murnane, R. J., 2003. The skill content of recent technological change: An empirical exploration. The Quarterly Journal of Economics, 118(4), 1279-1333.

Autor, D. H., Katz, L. F., and Kearney, M. S., 2006. The polarization of the US labor market. American Economic Review, 96(2), 189-194.

Banerjee, A. V., and Duflo, E., 2008. What is middle class about the middle classes around the world? Journal of Economic Perspectives, 22(2), 3-28.

Berg, A., Ostry, J.D. and Zettelmeyer, J., 2012. What makes growth sustained? Journal of Development Economics, 98 (2), 149–66.

Bergh, A., and Nilsson, T., 2010. Do liberalization and globalisation increase income inequality? European Journal of Political Economy, 26, 488-505.

Bergh, A., and Nilsson, T., 2014. Is globalisation reducing absolute poverty? World Development 62, 42-61.

Blackburn, M. L., and Bloom, D. E., 1985. What is happening to the middle class? American Demographics, 7(1), 18-25.

Brady, D., 2009. Economic globalization and increasing earnings inequality in affluent democracies. In: N. Bandelj (ed.), Economic Sociology of Work (Research in the Sociology of Work, Volume 18). Emerald Group Publishing Limited, 149-181.

Chen, X., Huang, B., and Li, S., 2017. Population ageing and inequality: Evidence from China. The World Economy, 41(8), 1976-2000

Coady, D. and Dizioli, A., 2017. Income inequality and education revisited: Persistence, endogeneity, and heterogeneity. IMF Working Paper 17/126, IMF, Washington DC.

Colciago, A., Samarina, A., de Haan, J., 2019. Central bank policies and income and wealth inequality: A survey. Journal of Economic Surveys, 33(4), 1199–1231.

Cragg, M. I., and Epelbaum, M., 1996. Why has wage dispersion grown in Mexico? Is it the incidence of reforms or the growing demand for skills? Journal of Development Economics, 51(1), 99-116.

Cruz, C., Keefer P. and Scartascini, C., 2016. Database of Political Institutions Codebook, 2015 Update (DPI2015). Inter-American Development Bank.

Cysne, R.P., 2009. On the positive correlation between income inequality and unemployment. The Review of Economics and Statistics, 91(1), 218-226.

Dabla-Norris, E., Kochhar, K., Ricka, F., Suphaphiphat, N., Tsounta, E., 2015. Causes and consequences of income inequality: a global perspective. IMF Staff Discussion Note 15/13, IMF, Washington DC.

Davis, J.C., and Huston, J. H., 1992. The shrinking middle-income class: A multivariate analysis. Eastern Economic Journal, 18(3), 277-285.

De Haan, J., Sturm, J.-E., 2017. Finance and income inequality: A review and new evidence. European Journal of Political Economy 50(1), 171–195.

Delis, M.D., Hasan, I., Kazakis, P., 2014. Bank regulations and income inequality: Empirical evidence. Review of Finance 18, 1811–1846.

Dorn, F., Fuest, C., and Potrafke, N., 2018. Globalization and income inequality revisited. CESifo Working Paper Series No. 6859.

Dreher, A., 2006. Does globalisation affect growth? Evidence from a new index of globalisation. Applied Economics, 38(10), 1091-1110.

Dreher, A., and Gaston, N., 2008. Has globalisation increased inequality? Review of International Economics, 16(3), 516-536.

Easterly, W., 2001. The Middle Class Consensus and Economic Development. Journal of Economic Growth, 6, 317-335.

Feenstra, R. C., and Hanson, G. H., 1996. Globalisation, outsourcing, and wage inequality. American Economic Review, 86 (2), 240–45.

Feenstra, R. C., Inklaar, R., and Timmer, M. P., 2015. The next generation of the Penn World Table. American Economic Review, 105(10), 3150-82.

Foster, J. E., and Wolfson, M. C., 2010. Polarization and the decline of the middle class: Canada and the US. Journal of Economic Inequality, 8(2), 247-273.

Galor, O., and Zeira, J., 1993. Income distribution and macroeconomics. The Review of Economic Studies, 60(1), 35-52.

Gregorio, J. D., and Lee, J. W., 2002. Education and income inequality: New evidence from cross-country data. Review of Income and Wealth, 48(3), 395-416.

Gygli, S., Haelg, F., and Sturm, J.-E., 2019. The KOF Globalisation Index – Revisited. Review of International Organisations, forthcoming.

Handcock, M.S., and M. Morris, 1999. Relative redistribution methods in the Social Sciences. New York: Springer-Verlag.

Hibbs, D., 1977. Political parties and macroeconomic policies. American Political Science Review, 71(4), 1467–87.

Horrigan, M. W., and Haugen, S. E., 1988. The declining middle-class thesis: a sensitivity analysis. Monthly Labor Review, 111(5), 3-13.

Jaumotte, F., Lall, S., and Papageorgiou, C., 2013. Rising income inequality: technology, or trade and financial globalization? IMF Economic Review, 61(2), 271-309.

Kenworthy, L., and Pontusson, J., 2005. Rising inequality and the politics of redistribution in affluent countries. Perspectives on Politics, 3(3), 449-471.

Lawrence, R. Z., 1984. Sectoral shifts and the size of the middle class. The Brookings Review, 3(1), 3-11.

Levy, F., and Murnane, R. J., 1992. US earnings levels and earnings inequality: A review of recent trends and proposed explanations. Journal of Economic Literature, 30(3), 1333-1381.

Littrell, J., Brooks, F., Ivery, J., and Ohmer, M. L., 2010. Why you should care about the threatened middle class. Journal of Sociology and Social Welfare, 37(2), 87-114.

McMahon, P. J., and Tschetter, J. H., 1986. The declining middle class: a further analysis. Monthly Labor Review, 109(9), 22-27.

Milanovic, B., 2005. Can we discern the effect of globalisation on income distribution? Evidence from household surveys. The World Bank Economic Review, 19(1), 21-44.

Milanovic, B. and S. Yitzhaki, 2002. Decomposing world income distribution: Does the world have a middle class? Review of Income and Wealth, 48 (2), 155–78.

Persson, T., and Tabellini, G., 1994. Is inequality harmful for growth? American Economic Review, 84(3), 600-621.

Ostry, J. D., Berg, A., and Tsangarides, C.G. 2014. Redistribution, inequality, and growth. IMF Staff Discussion Note 14/02.

Potrafke, N., 2015. The evidence on globalisation. The World Economy, 38(3), 509-552.

Pressman, S., 2007. The decline of the middle class: an international perspective. Journal of Economic Issues, 41(1), 181-200.

Ravallion, Martin, 2010. The developing world's bulging (but vulnerable) middle class. World Development, 38(4), 445-454.

Rosenthal, N. H., 1985. The shrinking middle class: myth or reality. Monthly Labor Review, 108(3), 3-10.

Scognamillo, A., Mele, G. and Sensini, L., 2016. Non-renewable resources, income inequality and per capita GDP: An empirical analysis. World Bank Policy Research Working Paper 7831.

Solt, F., 2016. Standardizing the World Income Inequality Database. Social Science Quarterly, 90, 231-242.

Sturm, J-E., and de Haan, J., 2015. Income inequality, capitalism and ethno-linguistic fractionalisation. American Economic Review, 105, 593-597.

Thurow, L. C., 1987. A surge in inequality. Scientific American, 256(5), 30-37.

Wade, R., 2004. Is globalisation reducing poverty and inequality? World Development, 32(4), 567-589.

Appendix

Table A.1: Effects on Low and Top 10% Income Shares.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Bottom 10%	Bottom 10%	Bottom 10%	Bottom 10%	Top 10%	Top 10%	Top 10%	Top 10%
VARIABLES	Baseline	KOFEcGI	KOFEcGIdf	KOFEcGIdj	Baseline	KOFEcGI	KOFEcGIdf	KOFEcGIdj
log GDP per capita	-0.0846	-0.0510	-0.0831	-0.0651	0.499	0.269	0.486	0.467
	(-0.664)	(-0.408)	(-0.679)	(-0.491)	(0.484)	(0.273)	(0.502)	(0.440)
Human capital index	-0.176	-0.182	-0.194	-0.170	-2.911	-2.873	-2.761	-2.921
	(-0.556)	(-0.572)	(-0.610)	(-0.538)	(-1.279)	(-1.281)	(-1.246)	(-1.290)
Largest government party is left-wing	0.137**	0.129**	0.133**	0.134**	-0.333	-0.279	-0.306	-0.328
	(2.410)	(2.349)	(2.491)	(2.354)	(-0.679)	(-0.575)	(-0.650)	(-0.659)
KOF Economic Globalisation Index		-0.0116**				0.0792**		
		(-2.279)				(2.270)		
KOF Economic Globalisation Index, de facto			-0.00820***				0.0692***	
			(-2.754)				(2.660)	
KOF Economic Globalisation Index, de jure				-0.00349				0.00576
				(-0.766)				(0.217)
Adjusted R-squared	0.117	0.133	0.135	0.118	0.059	0.077	0.089	0.058
Number of observations	828	828	828	828	828	828	828	828
Number of countries	132	132	132	132	132	132	132	132
Number of periods	9	9	9	9	9	9	9	9
F-test period-fixed effects	1.30e-05	0.000289	3.55e-05	0.000267	1.48e-05	0.000442	8.42e-05	0.000127

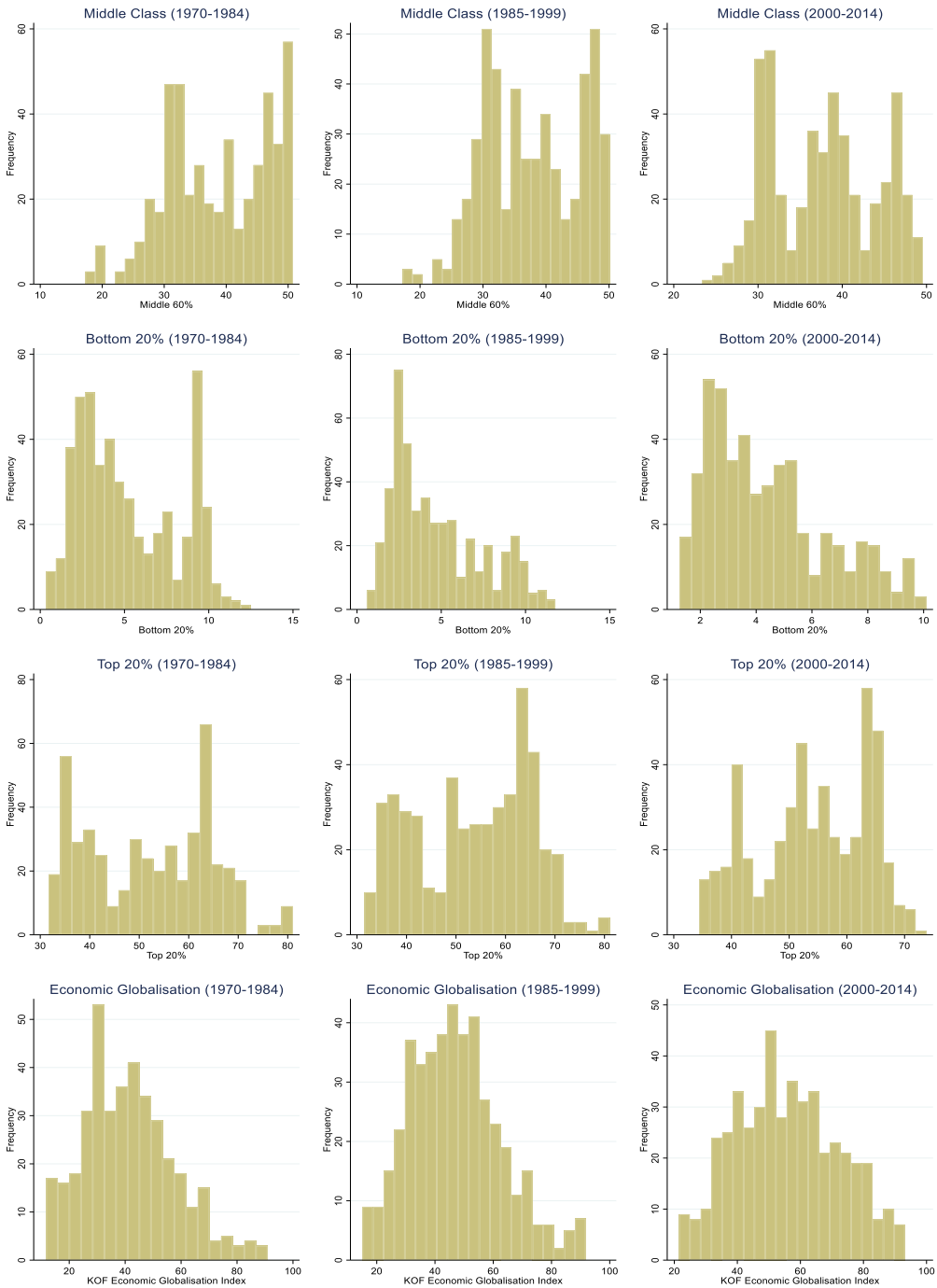
Notes: Table shows the effects of economic globalisation variables on the lowest (*Bottom 10%*) and highest (*Top 10%*) deciles' income shares using the fixed-effect model. The respective shares are depicted in the top row. The second row denotes the included globalisation variable (see notes to Table 2). The baseline model includes no globalisation variable. Standard errors are clustered at the country level. *** p<0.01, ** p<0.05, * p<0.1. Robust t-statistics in parentheses. Country- and period-fixed effects are not shown.

Table A.2: Summary Statistics of Additional Controls

Variable	N	Mean	SD	Median	Min	Max	Source
ICT capital stock share	637	0.04	0.04	0.03	0	0.2	Jaumotte et al. (2013)
Inflation rate	828	2.33	5.66	2.91	-26.54	21.69	DPI (2015) (Cruz et al. 2016)
Democracy	797	4.25	6.2	7	-9	10	Polity IV dataset (2016)
Agriculture, value added (% of GDP)	706	15.76	13.65	11.3	0.04	59.28	World Development Indicators (WDI)
Total natural resources rents (% of GDP)	828	6.54	9.57	3.04	0	67.68	World Development Indicators (WDI)
Age dependency ratio (% of working-age population)	828	65.71	18.67	60.06	34.21	112.63	World Development Indicators (WDI)
Total unemployment (% of total labor force)	605	8.27	5.58	7.06	0.24	37.63	World Development Indicators (WDI)

*Note*s: At most 132 countries are covered in nine 5-year periods from 1970 to 2014.

Figure A.1: Histograms.



Notes: Graph shows the histograms of the income shares of the middle class, bottom 20% and top 20% as well as the KOF Economic Globalisation Index for three time periods. The y-axis denotes the observation frequency within the respective time frame.