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Determinants of Global Income Inequality:
Concerns and Evidence about the Neoliberal Paradigm

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Abstract

This paper analyses the main drivers of global income inequality while testing some of the most relevant economic theories on inequality evolution. We run fixed effects regressions on four different income inequality measures, using a panel of 157 countries, for the period 1960-2015. We find evidence that, while labor market reforms and unemployment were two upturning drivers of inequality, governments have an important rebalancing role, despite their decreased size. Furthermore, although social and political globalization reduced inequality, overall globalization and the widening of financial systems increased inequality. These findings suggest that the 1980s transition from post-war regulated capitalism to neoliberal capitalism led to a worldwide upsurge of inequality within countries. The effect of liberalization on inequality is confirmed when we perform a causal analysis using the European Eastern Bloc transition of the 1990s as a quasi-experiment.

Keywords: inequality extraction ratio, income inequality, augmented kuznet's curve, country fixed effects, difference-in-differences.

> "What thoughtful rich people call the problem of poverty, thoughtful poor people call with equal justice a problem of riches."
> *Richard H. Tawney, 1913*

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1   Introduction

Global inequality has been rising over the last 30 years and today is at the forefront of the public debate. Former US President Barack Obama declared it as the "defining challenge of our time" and IMF director Christine Lagarde has been driving attention towards the priority of fighting rising inequality, to tackle the *middle-class crisis*. Pope Francis speaks against the current "economy of exclusion" which promotes growing inequality, the "root of social evil".

There is an intrinsic sentiment of unfairness towards the current global economic system, which intensified after the most-severe financial crisis since the "Great Depression". In 2014, when asked about the greatest threat to the world, 60% of respondents in western societies (Europe and US) replied that "concerns about inequality trump all others" (Pew Research Center). Even before the crisis, 90% of the people in countries like Portugal and Italy agreed that inequality was too high (OECD, 2008). After the "Great Recession" of 2007-2008, much attention has been devoted to the struggle of the bottom 99% who have less wealth than the swelling top 1%, with vast manifestations of disgruntlement from movements like Occupy Wall Street (Credit Suisse, 2016).

Beyond the public opinion, experts and researchers are stressing out the severity of the degree of inequality and the aftermaths it poses on political stability, social cohesion and sustainable prosperity. The World Economic Forum outlined rising inequality as the biggest risk for the global economy in 2017, and that the gap between top and bottom deciles was at the root of Donald Trump's victory and the Brexit (The Global Risks Report, 2017). Recent Oxfam reports speak of growing crony capitalism which endorsed widening inequality even at the very top.[1] The number of the richest billionaires who detain the same wealth as the bottom half of humanity went from 388, in 2010, to 62 with their wealth growing by 44% in just 5 years (Hardoon et al., 2016). Shockingly, this year's report announced that the number decreased to just eight people (Hardoon, 2017). Moreover, about one-third of the 1810 billionaires in 2016 Forbes List, who possess the same as the bottom 70%, inherited their wealth (Jacobs, 2015).

Figure 1: World Income Inequality Rise: Market Gini – Deciles

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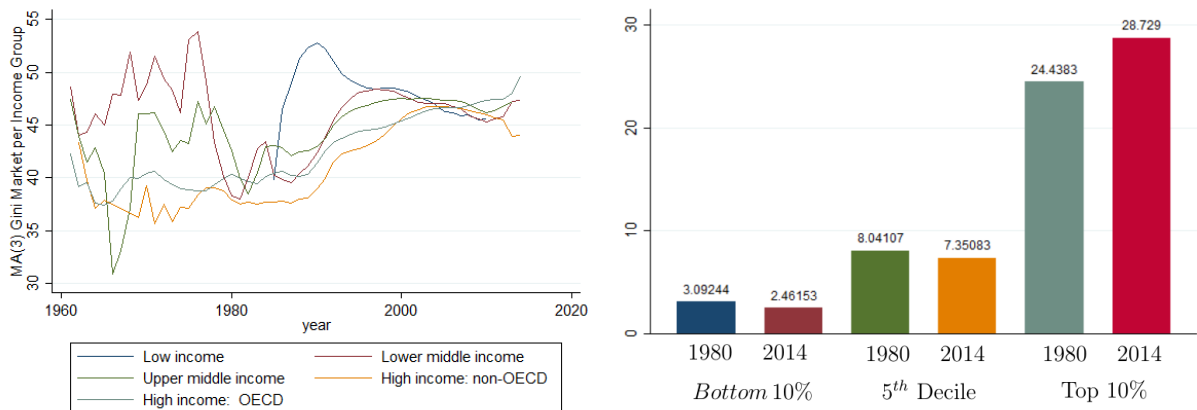
[1]Cronyism is the form of capitalism which technically operates as a free-market but depends on preferential regulation, tax breaks and other forms of favorable state interventionism, which are achieved through close connections to government officials.

Although wealth inequality is higher than income inequality, the two are evermore interconnected as those at the top have a larger proportion of capital income and their labor compensation is indexed to the stock and option markets (OECD, 2015). Since 1980, the real average pre-tax income of the bottom 50% stagnated, whereas the income of the top 1% grew fourfold, earning more than 80 times that of the former (Piketty and Zucman, 2016). Moreover, between 1940 and 1980, the ratio of the average executive (CEO) compensation over the mean wage – which is much higher than the median wage – was stable around 50, while after the 1980s it skyrocketed, reaching 350 in early 2000s (Frydman and Saks, 2005).

Following Atkinson (2015), to briefly describe the evolution of global income inequality, over the last century, one must distinguish its within and between dimensions. Initially, inequality within rich countries was falling and differences between countries where widening. This period was followed by another where inequality between countries converged but inequality within countries amplified. Figure 1 portrays the convergence of global market income inequality, around 1980, followed by a common upward trend across income groups. From 1980 onwards, countries with very different degrees of development converged to higher levels of inequality, registering a worldwide upsurge in market ginis of 5 to 10 percentage points. It also shows the growth in the share of the world's top 10%, which today have roughly 30 percent of the world's income, at the expense of shrinking bottom 10% and 5th deciles shares – evidencing the widening of imbalances within countries, across the globe.

This paper investigates and assesses the main drivers of global income inequality, using a panel of 157 countries constructed by the author, combining several datasources, over the period 1960-2015. Section 2.1 presents an overview of the literature on the relationship between growth and inequality. Sections 2.2 and 2.3 summarize the main theories and empirical findings relating inequality with labor markets, globalization and financial markets. Section 3 describes the data construction and respective sources. The three econometric methodologies are explained in Section 4, followed by our empirical results in Section 5: first we investigate the relationship between growth and income dispersion; the main determinants of inequality are analyzed in subsection 5.2; lastly, we delve into the exposure of the Eastern European Bloc to the global economy as a quasi-experiment. In Section 6 we propose an historical explanation for the *Inequality Turn* (1980s) relating to our main findings. We finally conclude in Section 7, providing some limitations and further research.

2 Literature Review

2.1 Inequality and Growth – Consequences

The most influential theory on the relationship between inequality and growth is the pioneering work of Simon Kuznet in 1955, who argued that inequality follows an inverted U-shaped path. Kuznet assumes a 2-sector (rural and urban) economy; development leads workers to shift from the more egalitarian agriculture to the more unequal industry, rising income and overall inequality. Later, with shrinking agriculture, the relative wage of rural workers increases, decreasing inequality. Modern adaptations divide the economy into old and new technology (e.g. Aghion and Howitt, 1997; Helpman, 1997) or

financially underdeveloped and modern sectors (Greenwood and Jovanovic, 1990). The temptation to conclude that inequality is an inevitable consequence of early growth and will eventually decline does not survive Kuznet's own claim that "The paper is perhaps 5 per cent empirical information and 95 per cent speculation, some of it possibly tainted by wishful thinking." (indeed, his analysis was based on a few observations from UK, USA and Germany).

Although cross-section studies before the neoliberal era (1980s onward) mostly confirmed the Kuznet curve (Ahluwalia, 1976, Paukert, 1973; Chenery et al., 1974; Bacha, 1979), later work suggested that it explains little of the variation in inequality (Papanek and Kyn, 1986; Kaelble and Thomas, 1991; Barro, 2000), it has weakened over time (Anand and Kanbur, 1993), and poorly fits the evolution of inequality within countries (Li, Squire, and Zou, 1998). Thereafter, it is imperative to assess how national idiosyncratic policies and institutions affect country's income distributions (Williamson, 1991; Kaelble and Thomas, 1991), particularly since the theory does not explain the "Inequality Turn" (Atkinson, 2015) of most industrialized countries, beginning in the 1980s (Gustafsson, 1999).[2]

As stressed by Stiglitz (1998), economists, inspired by the Second Theorem of Welfare Economics, have traditionally separated equity from efficiency, with some interpreting the division as a tradeoff (e.g. Okun, 1997). However, as many neoclassical models, it relies on unrealistic assumptions such as no unemployment, complete markets, and perfect information. Abandoning representative agents models, there is a growing literature on the recessive effects of inequality, with empirical support surveyed in Benabou (1996), and in the meta-analysis by Neves et al.(2016). Significant negative relationships between different measures of inequality and growth were found with panels of more than 50 countries for 1960-1985 (Alesina and Rodrik, 1994; Persson and Tabellini, 1994; Perotti, 1996) and during the 1970s, for both democratic and non-democratic countries (Clark, 1995). From 1960s to 1990s, most research has found recessive inequality effects, using the Deininger and Squire inequality database,[3] with the exception of some studies employing System GMM and panel techniques (Li and Zou, 1998; Deininger and Olinto, 2000, Forbes, 2000). These positive impacts have been challenged by Lee and Son (2016), using the same method with more recent data, and Barro (2000), who noted the small sample and the sensitivity to measurement-error. New evidence reinforces the negative impact of inequality on growth and its sustainability (Berg and Ostry, 2011), but also finds that redistribution does not significantly hinder growth – rejecting Okun's proposition (Ostry et al., 2014). In another IMF paper, authors found an inverse relationship between the share of the top 20% and growth (benefits do not tickle-down) whereas increasing the share of the first, second and even the third quintiles (poor and middle-class) significantly promotes growth (Dabla-Norris et al., 2015).

The consequences of inequality go beyond its impact on GDP. It may concentrate decision making power on few agents, cause political instability, bring about suboptimal

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[2]Jaumotte (2013): "While improvements in technology, liberal market-oriented reforms, and the entry of China and countries from the former Soviet bloc into the global economy have led to an unprecedented level of integration of the world economy (...) inequality has risen in most countries and regions over the past two decades, including in developed countries which were thought to have reached levels of prosperity where inequality would level off in line with the predictions of the Kuznet's hypothesis."

[3]Deininger and Squire, 1998, Birdsall and Londono, 1997, Castell and Domench, 2002; Banerjee and Duflo, 2003, Knowles, 2005

human resource allocation and raise the risk of crisis (Dabla-Norris et al., 2015). If it rests on rents, agents invest in seeking favored treatment which may lead to nepotism, corruption, erosion of social cohesion, and of institutional confidence (Stiglitz, 2012). Several empirical studies found that inequality impelled socio-political instability, in turn giving rise to more inequality – "vicious cycle of inequality" (Stiglitz, 2012) – and consequently dulled growth.[4] Other outcomes negatively impacted by inequality include: school enrollment (Checchi, 1999); happiness (Ramos, 2014); intergenerational mobility, as shown by Corak's (2013) *The Great Gatsby* curve.[5] Finally, using a panel of 112 countries over the period 1970-2010, Kotschy and Sunde (2015) found that equality is crucial for the positive and lasting association between democracy and institutional quality.

2.2 Labor Markets

One of the mechanisms linking labour markets to inequality is the "skill-biased technological change" (SBTC), i.e., the increase in the relative demand for highly skilled workers *vis-à-vis* the unskilled caused by the technological revolution of circa 1980. Empirically, it is difficult to assess and "is usually subsumed in the unexplained part of modeling", although Katz and Autor (1999) view it as the most important driver of inequality based on their literature review.[6] Using a panel of 51 countries from 1981 to 2003, Jaumotte et al. (2013) finds that the share of ICT in capital stock was the main determinant of inequality. Kanbur and Stiglitz (2015) argue that these competitive marginal productivity theories of factor returns assume a constant share of capital, which is not consistent with the reality of many industrialized economies, and that new models need to incorporate rent-generating mechanisms and a greater focus on the "rules of the game" (Stiglitz et al. 2015). Brown and Cambell (2002) show that ICT explains inequality in less developed countries, whereas in advanced ones globalization is more important.[7] Card and DiNardo (2002) argued that SBTC should have widened gender inequality, which did not occur, and Atkinson (2007b) said that "constant SBTC rate does not yield a permanent skilled/unskilled wage differential, as long as the relative supply is sufficiently elastic". Bogliacino and Lucchese (2011) use a quasi-experiment to conclude that international differences are determined by labor market flexibilization and tax reforms, and not SBTC. Lemieux (2008) argues that SBTC totally neglects the role of institutions while he finds that deunionization alone explained one third of expanding inequality, in the United States, and performance pay at the top (bonuses, stocks and options) accounts for a substantial inequality growth in the top quintile.[8]

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[4]Londregan and Poole, 1990; Alesina and Perotti, 1996; Perotti, 1996; Svensson, 1998; Sylwester, 2000; Keefer and Knack; 2002.

[5]Ramos (2014) reviews the papers that use self-reported measures of satisfaction as a proxy for well-being and controls for individual fixed effects. Intergenarational mobility is the elasticity between the child's adult earnings and that of its parents – essentially, how much does the income of the parents determines the future income of their children.

[6]Handbook of Income Distribution, Volume 2B (Checchi et al., 2015) Chapter 18: Labor Market Institutions and the Dispersion of Wage Earnings.

[7]Krugman (2008) criticized his earlier view that technology explained the inequality upturn much more than the process of globalization. Irwin (2008), Katz (2008) and Autor (2010) also criticize the neglected role of globalization. Atkinson (2008) points out that a supply response over the SBTC would only lead to a higher level of inequality and not to the permanent upward trend since 1980.

[8]Consistent with the findings of Alvaredo et al., 2013; Atkinson and Piketty, 2007, 2010; Atkinson et al., 2011; Piketty and Saez, 2003, 2006.

The institutional approach gained emphasis in the 1990s and focuses on labor market institutions like minimum wage, collective bargaining, employment protection legislation (EPL) and unionization.[9] Though it is easier to test empirically, findings are mixed. Labor market institutions can have equalising effects on the employed at the expense of increasing unemployment. Card and Krueger (2015)'s recent survey of the empirical literature concludes for little or no effect of minimum wages on employment. Higher EPL may worsen income distributions through unemployment (Lemieux et al., 2009). A decline in union rates tends to reduce relative bargaining power of workers, and can also decrease inequality of opportunities.[10] Overall labor market deregulation tends to worsen the distribution of income (Calderon and Chong, 2009; OECD, 2011), increase the share of the top decile and decrease that of bottom 10% (Dabla-Norris et al., 2015), and is often associated with waning working conditions of workers (OECD, 2004; Hberli et al., 2012).

2.3 Globalization and Financial Markets

Globalization and financial openness have been the dominant economic paradigm over the last three decades, coinciding with between-country convergence and within-country divergence, fueling a mayhem of opinions in the public and academic debate. The mechanism that may link the two operates through labor income. Globalization encompasses increase in trade and financial flows across nations, flourishing from liberalization; and increase in foreign direct investment (FDI) (Mah, 2003).[11] Some argue that economic integration helps reduce poverty, promote democracy, and reduce inequality (see, e.g., Bhagwati, 2004, and Zhou et al., 2011, for the millions of people lifted out of poverty in India and China). Others that it promotes economic insecurity and inequality in developing and developed countries.[12]

According to the neoclassical Heckscher-Ohlin model, (Stolper-Samuelson's 1941 theorem) trade openness increases the relative return of the abundant factor – capital and/or high-skilled labor in developed countries, and labor in developing ones – thus increasing inequality in the former and decreasing it in the latter.[13] The theory is consistent with the co-existence of growth and reduced inequality in the "East Asia miracle", but inconsistent with prolonged inequality increases in Brazil (with high growth) and India (with stagnation) in the 1960s and 1970s, and the rising trade and inequality of some Asian and many Latin American economies in the post-1980 period.[14] In fact, some studies found evidence

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[9]Blackburn et al. 1990, Freeman 1991, Levy and Murnane (1992), Fortin and Lemieux 1997, DiNardo and Lemieux 1997.

[10]For the equalizing effects of unions see e.g. Card et al., 2004; Herzer, 2014; Dabla-Norris et al., 2015; Osorio-Buitron et al., 2015; For papers refering to the positive association between union density and worker's bargaining power refer to e.g. Frederiksen and Poulsen, 2010; Wilkinson and Pickett, 2010; Checchi et al. (2008) found positive correlations between equality of opportunities and: union density, wage centralization and labor market regulations.

[11]David Kotz (2015) sees globalization as "significant increase in the movement of goods, services, capital, and money across national boundaries, resulting in a capitalism that is more globally integrated than before, including the creation of global production and distribution chains far more developed than those existing in earlier periods".

[12]see e.g. Bergh and Nilsson, 2011; Cornia et al., 2004; Marjit et al., 2004; Stiglitz, 2002; Borjas and Ramey, 1994.

[13]The mechanism works through the respective specialisation of the developing country in the low-skilled-intensive technology and the developed one in the capital or high-skill-intensive one.

[14]Handbook of Income Distribution (Kanbur, 2015), Chapter 20: Globalization and Inequality.

of globalization increasing inequality in both developing and advanced economies.[15] Additionally, while some studies found no clear relationship between trade and inequality (Edwards, 1997; Li, Squire and Zou, 1998), others finds that trade increased inequality in developed countries but not in developing ones (Sebastian, 1997; Dreher and Gaston, 2008), and some papers' results are entirely at odds with the theorem's predictions.[16]

The lack of empirical consistency of the Heckscher-Ohlin theory prompted several authors to extend the model in a number of directions.[17] In a setting where final output is produced using intermediate inputs and there is free-trade – such as the globalized economy –, develop countries outsource intermediate production phases to developing countries. This FDI reallocates the activity that is least-skilled intensive in the eyes of the advanced economy and the most-skilled intensive in developing countries. Thus, outsourcing exacerbates the production skill intensity in both types of economies, widening the income dispersion in both countries (a SBTC mechanism). Accordingly, Jaumotte et al. (2013) finds a positive association between inward FDI and inequality (while exports relative to GDP have an equalizing effect). Similarly, Asteriou et al. (2014) found that trade decreased, financial openness increased, and technology had no impact on inequality in EU-27, with FDI being the major driver.[18]

A different explanation which is also consistent with these results is the dependency theory (Firebaugh and Beck, 1994), which argues that FDI and trade create dependency of developing countries on advanced ones, with negative socio-economic consequences in the long term. Large multinationals can form a high capital-intensive exporting sector, separated from the rest of the economy (creating dualism in productive structures), only to then extradite most of the accrued profits (Faustino et al., 2011).

Theory offers ambiguous predictions on the relationship between financial development and income distribution. The extensive margin of allowing the poor access to financial services has an equalizing effect (Abiad et al., 2008). The intensive margin of quality and range improvements upgrades the conditions for those already enjoying financial services (Greenwood and Jovanovic, 1990). Consistent with the predictions of Claessens and Perotti (2007) that most of the benefits are attained by a small elite, Jaumotte et al. (2013) found that financial openness mainly benefited the top 20%, Roine et al. (2008) concludes that financial openness is pro-rich, and Das and Mohapatra (2003) found evidence that equity market's liberalization benefits the top quintile at the expense of the "middle class", with no effect on the poor. This conclusion is conditional on weak institutions that allow access to finance to be molded by those who have political influence, to maximize their benefits (Rajan, 2003; Delis et al, 2014; Chong, 2007; Law et al.,

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[15]Beck et al., 2007; Dollar and Kraay, 2004; Goldberg-Koujianou and Pavcnik, 2007; International Monetary Fund,2007a,b; Freeman, 2010 though FDI which they argue to be concentrated in higher skill- and technology-intensive sector.

[16]Brenton, 1998; Savvides 1998; Barro, 2000; Haskel and Slaughter, 2000, 2001; Lundberg and Squire, 2003; see also Winters, et al. (2004) literature survey conclusions; Milanovic and Squire, 2005; Gourdon et al. 2008; Stockhammer 2013, 2017. Empirical support may be found, e.g., in Wood, 1994; Bourguignon and Morrisson, 1990; Caldern and Chong, 2001; Bergh and Nilsson 2010; Hanson and Harrison, 1999.

[17]See, e.g., Wood's (1994) three-factor model, Davis's (1996) three-goods one. Helpman et al. (2010) focus on worker and firm heterogeneity where production involves a fixed cost, and inequality may increase in both types of countries because of the selection effects in exporting decisions.

[18]see also Lee (2006) who showed that FDI raises inequality significantly, using a panel of 14 old EU members for the period 1951-1992; Acharyya (2011) which is in line with the SBTC view on FDI; Wu and Hsu (2012) also found evidence that FDI increase inequality in countries with low levels of absorptive capacity, using a panel of 54 countries over the period of 1980-2005.

2014). On the other hand, with panels of more than 50 countries, and using M2/GDP or credit variables as proxies, some papers found evidence of equalizing effects from financial openness.[19] Zhang (2016) found that financial access, deepening and stability reduce inequality while liberalization increases it. Empirical literature using credit and stock market capitalization as measures of financial openness found positive relationships with income inequality.[20] Lastly, Stockhammer (2013, 2017) found that financialization, which is associated with the decay of labor bargaining power, has had the largest contribution to the decline in the wage share and, thus, increased inequality since capital is more concentrated (see e.g. Dumenil and Levy, 2011).

3 Data and Variables

3.1 Inequality Measures

We choose four measures of income inequality. The most commonly used is the gini coefficient which ranges from 0 (total income equality) to 100 (one person has all national income). We use the net gini coefficient (income distribution after taxes and transfers) and the market/gross gini to capture the importance of government and the effects it hinders on various exogenous forces. One limitation of gini coefficients is that they are more sensitive to changes around the mean (Dabla-Norris et al., 2015; Piketty and Saez, 2013; Kakwani, 1980). Moreover, recent literature is stressing the fact that inequality trends are closely related to what happens at the top of the distribution and that "the study of top incomes is important from the standpoint of overall inequality and of the design of public policy" (Piketty et al, 2011). Accordingly, we also use the income share of the top 10 percent.

Unlike vastly used series such as GDP, inequality is usually estimated with higher measurement error with differences in terms of population, age and geographical coverage, welfare proxy (e.g. gross income or consumption), equivalence scale applied and inclusion of items like non-monetary income and imputed-rents – which represented 10 percent of UK's 2012 GDP (Atkinson, 2015).[21] For these reasons, cross-country and time-series analysis is burdened with a tradeoff between coverage and comparability (Atkinson and Brandolini, 2001). From all inequality databases, the Standardized World Income Inequality Database (SWIID) and the UNU-WIDER World Income Inequality Database (WIID) are the most adequate for panel cross-country analysis.

The SWIID uses a missing-data multiple imputation algorithm to standardize observations from various sources: WIID, Luxembourg Income Study, World Bank, Eurostat, OECD Income Distribution Database, and many others.[22] By doing so, it maximizes the comparability and it is the largest inequality dataset, covering 174 countries for the period from 1960 to 2015. In this paper we use its latest version (SWIID 5.1) to retrieve the net

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[19]Naceur and Zhang, 2016; Hamori and Hashiguchi, 2012; Kappel, 2010; Beck et al., 2007; Clarke et al., 2006.

[20]Gimet, 2011 found that the effect is mainly channeled by the banking sector; Jauch and Watzka, 2012; Li and Yu, 2015; Denk and Cournde, 2015; Jaumotte and Buitron, 2015.

[21]Equivalence scale methodologies account for economies of scale within a household by applying decreasing weights to additional members of the latter, and lower values for children.

[22]Frederick Solt, 2009, "The Standardized World Income Inequality Database", hdl:1902.1/11992, Harvard Dataverse, V15.

and market gini coefficients, and construct the Inequality Extraction Ratio – our fourth measure of income inequality.

On the other hand, the WIID provides multiple country-year duplicates from different sources, incorporating 8 selection criteria variables discriminating the comparability concerns explained above.[23] We downloaded the income distribution variables – deciles and quintiles – from the WIID 3.4 (Jan. 2017), based on a rigorous comparability selection: only observations covering total population, age and area, ranked high or average quality, based on family or household and expenditure or disposable income, were used.[24]

3.1.1 Inequality Extraction Ratio

Another limitation of the gini is that is makes little sense when assessed at the upper bound. A society with a (net) gini close to 1 is one where almost everybody has no income at all. Consequently, these individuals would not be able to afford basic living consumption, and would eventually die. Therefore, an annual gini of 1 would ultimately approach 0 within the same year. The innovative Inequality Extraction Ratio (IER), developed by Branko Milanovic (2007), deals with this limitation. Suppose the society is composed solely of 2 groups – the elite and the rest of the population – where the former can be seen as one person and individuals within each group receive the same mean income. The maximum feasible gini is reached in the situation where everybody receives the physiological minimum of subsistence except for the elite, which gets the entire surplus of total income.[25] This maximum follows a positive and concave relationship with the economy's mean income (GDP per capita), and this function is defined as the inequality possibility frontier (IPF). The IER is then the ratio of the standard gini over the maximum gini.

Constructing the IER for different countries and years poses some methodological challenges, specifically due to the computation of the maximum gini. Following the methodology of Milanovic, to proxy a country's development level, we used the GDP per capita (1990 GK$) from Maddison's Project database.[26,27] Furthermore, we assumed the physiological minimum to be 300 (1990 GK$) as it is consistent with the Word Bank's absolute poverty line of $1.08 per day in 1993 dollars PPP (Chen and Ravallion, 2007), which corresponds to 365 (1990 GK$) annually. Given that it has been estimated that close to a billion people live below that threshold, it is reasonable to take this value as the subsistence minimum (Milanovic, 2010).[28] Additionally, one must consider that, just like national poverty lines, the minimum acceptable income in a society increases as it develops – i.e. physiological minimum becomes social minimum (Chen and Ravallion, 2013). This is in line with the view of economist like Amartya Sen who see poverty be-

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[23]UNU-WIDER, World Income Inequality Database (WIID3.4).

[24]As stressed by Jenkins (2014), it is imperative that authors report and justify the algorithm and selection rules used for the subsample.

[25]The interest reader may find the full analytical derivation of the maximum feasible gini and the IER, following Milanovic (2010), in the Appendix.

[26]The Geary-Khamis dollar is the most used international currency measure for comparisons across countries and over time. It is used to compare living standards since it incorporates both the average price of commodities and the concept of purchasing power parity.

[27]The Maddison-Project, http://www.ggdc.net/maddison/maddison-project/home.htm, 2013 version.

[28]Note also that the lowest GDP per capita in our dataset is 403 (1990 GK$), corresponding to Sierra Leone in 1999.

yond a physiological condition. However, the social minimum does not increase with the country's mean income in a proportional manner – elasticity λ is lower than 1. Empirical literature on subjective poverty suggests that this elasticity is between 0.4 and 0.7 (Flik and van Praag, 1991), whereas others found that it is around 0.33 for most countries and zero for the 20 poorest nations (Chen and Ravallion 2013). Henceforth, we take the World Bank's classification of country's income level and assign elasticities to formula (1), in the following way: Low income=0, Lower middle income=0.3, Upper middle income=0.4, High income: non-OECD=0.55 and OECD=0.7.

$$G^{Max}(\alpha, \lambda_{IncGroup}) = 1 - \frac{1}{\alpha}\alpha^\lambda \quad \mapsto \quad IER = \frac{Gini}{G^{Max}} \tag{1}$$

This is the formula for the maximum gini in a society with only the 2 groups mentioned, where the proportion of the elite approaches zero ($\varepsilon \to 0$) and α is the economy's mean income relative to the subsistence level. As we can see, the maximum feasible inequality increases with the countries relative development (α) but with higher elasticities (λ) it is reached sooner. Despite the fact that the IER does not satisfy one of the World Bank's *Poverty Manual, 2008* criteria for inequality measures (mean independence), it accounts for the development level of a country and proxies the share of inequality the elite is extracting from the maximum gini possible (Milanovic, 2013). To our knowledge this is the first study to build the IER in a panel dataset for modern cross-country analysis.

3.2 Determinants

To proxy levels of globalization, we use the KOF Index (Dreher and Axel, 2006; updated in 2008) which ranges from 0 to 100 and is available for 150 countries from 1970-2013. The index is a weighted average of 3 components of globalization: economic (36%), social (38%) and political (26%). In turn, each of the components are weighted indexes of relevant variables.[29]

In order to assess the weight of the financial system in each country we resort to the External Wealth of Nations Mark II database (Lane and Milesi-Ferretti, 2011) comprising data on financial assets and liabilities for portfolio equity, FDI, debt, derivatives and foreign reserves (minus gold), from 1970-2011, for 188 countries. We construct the variable *Financial Openness* by summing total assets and liabilities over GDP (USD), making it comparable across countries and suitable for panel regressions.

The Fraser Institute develops the Economic Freedom of the World 2016 database which uses data from the WTO, IMF, World Bank, WEF and others to construct standardized indexes and sub-indexes for 5 different areas (government, legal system, monetary policy, international trade and regulation), covering 160 countries, over the period of 1970 to

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[29] Economic globalization = [Actual Flows (50%)–Trade (% of GDP) (21%)+ Foreign Direct Investment, stocks (% of GDP) (27%)+ Portfolio Investment (% of GDP) (24%)+ Income Payments to Foreign Nationals (% of GDP) (27%)] + [Restrictions (50%) = Hidden Import Barriers (24%)+ Mean Tariff Rate (28%)+ Taxes on International Trade (% of current revenue) (26%)+ Capital Account Restrictions (22%)]; Social globalization = [Personal Contact (33%) = Telephone Traffic (25%) + Transfers (% of GDP) (4%) + International Tourism (26%) + Foreign Population (percent of total population) (21%) + International letters (per capita) (24%)] + [Information Flows (35%) = Internet Users (per 1000 people) (36%) + Television (per 1000 people) (37%) + Trade in Newspapers (% of GDP) (27%)] + [Cultural Proximity (32%) = Number of McDonald's Restaurants (per capita) (45%) Number of Ikea (per capita) (45%) Trade in books (percent of GDP) (10%)]; Political globalization = Embassies in Country (25%) + Membership in International Organizations (28%) + Participation in U.N. Security Council Missions (22%) + International Treaties (25%).

2014. As a proxy for *Government* size, we compute the simple average of the underlying data from 3 relevant components of government index: transfers and subsidies (*Transfers*), public consumption and public investment shares (Dabla-Norris et al., 2015). To measure labor market flexibility, we use the sub-index of labor market regulation's (5B) (Gwartney et al. 2012), which ranges from 0 to 10 (= no regulations), taking in dimensions such as hiring and firing regulations, collective bargaining, dismissal cost, conscription and minimum wages. To our knowledge, no paper as studied the impact of this variable on inequality before.

Data for unemployment was downloaded from the World Bank's WDI which collected national estimates as percentage of total labor force from the ILO's Labor Market database. The dummy for socialist countries was generated by us, taking the value of 1 if the country was part of the Soviet Union, Yugoslavia, or is considered as communist.[30] Furthermore, we use the Penn World Tables (PWT 9.0) database to extract the share of government consumption at PPP (*State*), the share of labor compensation, the population level in millions, the *Human Capital* index – based on Barro-Lee educational database. The proxy for tax system progressivity is the average rate progression up to four times the mean income (ARP_all of the World Tax Indicators database).[31] The democracy measure used ranges from -10 (total autocracy) to 10 (total democracy) and was downloaded from the Polity IV database (Marshall, 2015), which covers 164 countries for at least the period from 1960 to 2010. The level of inequality in education is measured by the educational gini constructed by Bas and Jieli van Leeuwen in 2013, and can be found in CLIO-INFRA database.

Finally, we also include a set of controls, retrieved from the World Development Indicators (WDI) database, that are usual in the literature: inflation, growth, urban and elderly population rate, female mortality rate, domestic credit and investment (% GDP), employment rate in agriculture and share of employment in industry.[32] Following Jaumotte (2013), a vital covariate is a measure for technology which we proxy with ICT exports share of total exports, retrived from UNCTADstat database.[33]

Our final dataset is an unbalanced panel of 157 counties, between 1960 and 2015.

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[30]See the Appendix for the complete list of countries identified by the dummy.

[31] "Average rate progression characterizes the structural progressivity of national tax schedules with respect to the changes in average rates along the income distribution. It is the slope coefficient from regressing actual average tax rates on the log of gross income." (Andrew Young School of Policy Studies, 2010)

[32]For the selection of relevant covariates when explaining inequality differences see e.g. Gustafsson 1999, Beck et al. 2000; Hopkins (2004) who conducts an extensive Bayesian approach, Lopez et al. 2008, Ballarino et al. 2012, Subir et al. 2013, Baumgarten 2014, Dabla-Norris et al. 2015.

[33]To incorporate the SBTC argument, the authors explicitly say that "Any empirical estimation of the overall effects of globalization therefore needs to explicitly account for changes in technology in countries."

Table 1: Descriptive Statistics

Variable	Mean	(Std. Dev.)	Min.	Max.	Obs.	Countries	Source
Inequality Extraction Ratio	45.1	(19.85)	14.63	185.55	3912	157	SWIID 5.1
Market Gini Coefficient	44.86	(8.37)	18.53	76.89	3912	157	SWIID 5.1
Net Gini Coefficient	36.31	(9.60)	14.06	67.21	3912	157	SWIID 5.1
Top 10% Share of Total Income	28.89	(7.84)	17.07	61.49	1463	140	WIID 3.4
Labor Market Flexibility Index	5.94	(1.44)	1.84	9.46	1529	129	Gwartney et al, 2012
Unemployment Rate	8.84	(5.82)	0	59.5	2283	136	ILO L.M.
Government Size	19.63	(7.58)	4.17	76.74	1770	132	Gwartney et al, 2012
Globalization Index	54.55	(18.44)	12.96	92.63	3452	150	Dreher et al, 2008
Financial Openness % GDP	299.93	(1495.01)	9.75	24074.93	3095	139	Lane et al, 2011
Political Globalization	65.01	(22.26)	3.18	98.42	3458	151	Dreher et al, 2008
Social Globalization	47.03	(23.12)	6.5	93.61	3458	151	Dreher et al, 2008
Income (GDP per capita)	8056.11	(7321.91)	403.53	39387.43	3912	157	Maddison, 2013
State Consumption % GDP	0.19	(0.09)	0.02	0.72	3663	146	PWT 9.0
Transfers + Subsidies % GDP	10.83	(8.23)	0	37.2	1633	123	PWT 9.0
Tax System Progressivity	0.04	(0.03)	0	0.14	1927	136	World Tax Indicators
FDI inward % GDP	0.42	(2.14)	0	44.74	3151	137	Lane et al, 2011
Socialist Dummy	0.24	(0.43)	0	1	3912	157	–
Democracy Index	4.2	(6.48)	-10	10	3204	140	Marshall, 2015
Human Capital Index	2.41	(0.70)	1.01	3.73	3425	129	PWT 9.0
Investment % GDP	2.71	(1.14)	0.27	11.19	3665	148	WDI
Labor Compensation % GDP	0.56	(0.11)	0.16	0.86	3268	118	PWT 9.0
Union Density Rate	37.33	(21.4)	4.95	99.07	1218	51	ICTWSS 5.1
Inflation Rate	0.48	(0.29)	0.04	2.24	3665	148	PWT 9.0
Educational Gini	30.85	(19.1)	3.77	99.41	3126	127	Bas et al, 2013
Female Mortality Rate	157.99	(119.83)	34.35	799.38	3694	152	WDI
Urban Population Rate	56.99	(23.03)	5.06	100	3787	152	WDI
Elderly Population Rate	8.27	(4.95)	1.13	23.59	3787	152	WDI
Population (millions)	52.21	(156.23)	0.06	1362.51	3665	148	PWT 9.0
GDP growth rate	3.7	(5.33)	-50.25	88.96	3571	150	WDI
Technology (ICT exports %)	5.9	(10.05)	0	63.64	1454	132	UNCTADstat
Domestic Credit % GDP	48.51	(43.39)	0.19	312.15	3357	146	WDI
Employment Rate in Agriculture	17.82	(17.54)	0.1	92.2	2240	133	WDI
Employment Rate in Industry	24.88	(7.49)	2.2	50.2	2264	133	WDI

4   Econometric Strategy

We begin our analysis of the determinants of global income inequality by testing the seminal Kuznets hypothesis and building on the augmented Kuznets relationship (Milanovic, 1994), running Pooled OLS. Econometrically, the Kuznets is tested by regressing the income per capita and its quadratic form, on a measure of inequality, expecting a significant positive sign for the former and a negative one for the latter.[34] Since there might have been unobserved global shocks (e.g. business cycles) influencing the level of inequality across countries, we add to Milanovic's approach by including time fixed effects δ_t in all specifications and account for heteroskedasticy using clustered standard errors in all specifications. We start by regressing the Kuznets reduced form and its augmented version which accounts for country's public policy factors: the extent of *State* consumption and the share of government *Transfers* (and subsidies) over GDP.[35] The augmentation incorporates factors that, from policy makers' point of view, are "given" in the short run and those that spring from policy decisions. Following the concerns of the literature, we argue that the progressivity level of a country's tax system and the degree of FDI intake are two important elements that should be included in the public policy scope (Williamson,

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[34]Following most of literature we use the natural logarithmic transformation of GDP per capita level.

[35]Milanovic (1994) used the share of workers employed in the state and para-statal sector.

1991; Kaelble and Thomas, 1991). Furthermore, we test the relevance of the political regime by including a dummy for countries that are considered socialist. Finally, we run the reduced form and our extended Kuznets relationship for the IER to see if the effects are the same and if the inverted U-relationship if verified. Thus, the full specification of our Pooled OLS analysis is the following:

$$Inequality_{it} = \theta_0 + \underbrace{\theta_1 \, ln(GDP_{capita})_{it} + \theta_2 \, ln(GDP_{capita})_{it}^2}_{\text{Kuznets Curve}} + \underbrace{\varphi_1 \left(\frac{Gov_c}{GDP} \right)_{it} + \varphi_2 \left(\frac{T+S}{GDP} \right)_{it}}_{\text{Augmented Kuznets Curve}}$$

(2)

$$+ \rho_1 Tax \, Progressivity_{it} + \rho_2 Socialist_i + \rho_3 \left(\frac{FDI_{in}}{GDP} \right)_{it} + \delta_t + \varepsilon_{it}$$

One limitation of doing Pooled OLS estimations is that it does not account for unobserved heterogeneity between countries and results might be biased because of omitted variables problem. Hence, aiming at finding the main drivers of inequality within countries, we conduct country fixed effects estimations, with time dummies and clustered standard errors, on all 4 measures of inequality. This method allows for time-invariant differences η_i in the error term, capturing only the net effect of the predictors on the outcome variable. Contrasting with fixed effects, random effects models rely on the strong assumption that these unobservables are orthogonal to the regressors. This assumption is likely to be violated as there are country characteristics (e.g. cultural factors) that might influence inequality and correlate with our predictors. To statistically confirm our intuition, we conduct Durbin-Wu-Hausman tests, rejecting the null that both models are consistent but fixed effects is inefficient in favor of the alternative hypothesis that random effects is inconsistent, in all specifications.

Our research question faces considerable challenges as there is no standard empirical specification nor a theoretical framework for the study of inequality.[36] The shift from regulated-capitalism to neoliberalism is characterized by considerable labor market reforms (deregulation), disregard for full employment policies, and downscaling of government's size (privatization).[37] Therefore, we begin with the reduced form of our model which only includes measures of *Labor Deregulation*, *Unemployment* and *Government*. Another feature associated to the neoliberal era is the widening of financial markets and expansion of international trade (liberalization) (Kotz, 2015). Hence, our baseline specification for the determinants of inequality adds the proxies for *Globalization* and *Financial Openness*.[38] Lastly, to account for factors that have been pointed out to be important in explaining inequality fluctuations, while testing for the effects of various covariates, we include vectors of political, social and economic controls.[39] Thus, the complete specification

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[36] Carter, 2007; Jaumotte, 2013; see also Atkinson and Brandolini, (undated). "The panel–of–countries approach to explaining income inequality: an interdisciplinary research agenda" for a review of 27 panel data studies of different determinants of income distribution.

[37] David Kotz (2015) defines regulated-capitalism as the form of capitalism in play in the post-war period until the oil crisis (1948-1973) and neoliberal-capitalism as the post-1980 paradigm.

[38] Note that, although economic globalization (KOF1) incorporates FDI and portfolio investments, the correlation of overall KOF and KOF1 with our measure of Financial Openness is only 0.1876 and 0.2575, respectively. Thus, no multicollinearity issues are at stake.

[39] For the full set of controls in each vector refer to the Complete Fixed Effect Regressions in the Appendix.

of our panel estimations can be written as:

$$Inequality_{it} = \alpha + \beta_1\, L\, Dereg_{it} + \beta_2\, Unem_{it} + \beta_3\, Gov_{it} + \gamma_1\, KOF_{it} + \gamma_2\, Financial_{OPENit}$$

(3)

$$+ \underbrace{\phi_1\, Political_{it} + \phi_2\, Social_{it} + \phi_3\, Economic_{it}}_{\text{Controls/Covariates}} + \eta_i + \delta_t + \varepsilon_{it}$$

Lastly, we apply Difference-in-Differences methodologies, using the end of the Cold War, marked by the fall of the Berlin wall in 1989, as a quasi-experiment, concentrating on the two gini measures which are the most commonly used indices of income inequality.[40] Here, the countries belonging to the Eastern European Bloc are taken as the treatment group, whereas the remaining European states (which we call Western) form the control group.[41] This procedure sheds light on the causality of the paradigm shift and the effects found in the previous analysis, as it explores sharp changes in economic and political environments undergone by the Eastern European countries, which did not occur in the West in that period – i.e. experimental design is appropriate.

Our panel data allow us to make the most out of the Double-Differences approach since it is possible to account for unobservable time-invariant heterogeneity η_i and group-invariant time effects δ_t, which could jeopardize our results due to selection bias.[42] The key identifying assumption – a weak form of strict exogeneity – is that the average outcome would have changed homogeneously across groups, in the absence of the "treatment" (*Transition*). This is empirically gauged by verifying the presence of an arguable common trend, across groups, in pre-treatment outcome evolution.

We firstly run Pooled OLS estimations on net and market gini coefficients, including a vector of covariates X_{it} found to be relevant in the previous analysis, that are significantly different across treatment and control groups, and for which there is pre-1990 data – i.e. controlling for observable time-varying differences.[43] To address the concerns raised by Duflo et al. (2004) about the inference validity using this methodology, we use Eicker-Huber-White standard errors, clustered in countries, to correct for autocorrelation and heteroskedasticity (Roger, 1993). Moreover, we conduct a placebo quasi-experiment

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[40]Mahutga and Bandelj (2008) argued that "directing attention to CEE [Central and Eastern European] countries [is] a historically unique opportunity to gauge the effect of exposure to the world economy on many development outcomes."

[41]Eastern Bloc (treatment group) is composed of Albania, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Macedonia, Moldova, Montenegro, Poland, Romania, Russian Federation, Serbia, Slovakia, Slovenia and Ukraine. The Western control group is made of: Austria, Belgium, Cyprus, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

[42]Note that the Fixed Effects estimations cancels out every time-invariant regressor such as the treatment dummy *Eastern* which corresponds to the estimated pre-treatment outcome differences between treatment and control groups.

[43]For a matter of consistency, we intended to investigate the causal effect of the liberalization on our four measures of inequality, however we exclude the *IER* and *Top Decile* from our analysis since the presence of a common trend was rather questionable.

where the transition is from 1999 to 2000.[44],[45] What is more, we employ Duflo's et al. recommendation of aggregating pre- and post- intervention data to have solely two periods, removing the time-series dimension – *Compiled* specifications in Table 5. To further appraise the robustness of the transition's causal effect on inequality, we employ country fixed effects estimations and finally regress the following full specification (3) on a subsample of 20 years.

$$Inequality_{it} = \alpha + \underbrace{\beta\, Eastern_i \times Post}_{\text{Transition Causal Effect}} + \rho\, Eastern_i + \gamma\, Post + \Phi\, X_{it} + \eta_i + \delta_t + \varepsilon_{it} \quad (4)$$

5 Empirical Results

5.1 Inequality and Growth – Kuznets Curve

Table 2: Augmented Kuznet's Curve Revisited

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Net Gini Coefficient	**Kuznet**	**Aug. Kuznet**	**Tax**	**Socialist**	**Financial**	**IER**	**IER Full**
Income	19.55**	31.86***	30.55***	37.52***	49.17***	-78.42***	-46.88***
	(7.943)	(6.352)	(8.345)	(9.305)	(10.56)	(12.04)	(13.49)
Quadratic Income	-1.417***	-1.980***	-1.878***	-2.323***	-3.037***	3.862***	2.129***
	(0.480)	(0.381)	(0.509)	(0.575)	(0.644)	(0.704)	(0.793)
State		-26.11***	-31.16***	-13.56	-10.10		-20.38*
		(6.678)	(7.265)	(9.056)	(10.23)		(11.45)
Transfers		-0.468***	-0.442***	-0.318***	-0.269***		-0.310***
		(0.0792)	(0.0918)	(0.0988)	(0.0953)		(0.105)
Tax System			-57.27**	-64.39**	-53.87**		-58.54*
			(25.60)	(24.58)	(26.19)		(34.64)
Socialist				-6.819***	-7.812***		-7.239***
				(1.924)	(2.092)		(2.376)
FDI inward					0.244**		
					(0.0959)		
Observations	3912	1633	726	726	686	3912	726
Countries	157	123	111	111	101	157	111
Adjusted R^2	0.283	0.512	0.568	0.605	0.632	0.693	0.800

Our results show the presence of a robust Kuznets curve relationship, explaining 28% of inequality variations in our complete panel – 157 countries, from 1960 to 2015. At odds with the findings of Anand and Kanbur (1993), we conclude that the relationship has not weakened overtime. Consistent with the literature we find that the inclusion of national idiosyncratic policies are important to explain inequality changes – the explanatory power doubles.[46] Thus, the results indicate that the relationship between growth and inequality is neither linear nor monotonic, and our findings are consistent with the theory that

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[44]Duflo, Bertrand and Mullainathan (2004) showed that the standard errors of constant regressors within clusters (e.g. treatment variables) are inconsistent and underestimated in the presence of positive autocorrelation: invalid inference. To illustrate the severity of the problem they recur to the CPS database to randomly create placebo laws at the state-level, finding significant effects (at 5% level) for 45 percent of these fake laws (treatments).

[45]As one does not expect to find significant inequality changes generated by the change in paradigm – e.g. liberalization – one decade later when there was no apparent structural transformation.

[46]Williamson, 1991; Kaelble and Thomas, 1991; Milanovic, 1994.

at early stages of development inequality rises but as the country develops there are equalizing forces at work. However, the development level at which this turning point occurs is much higher than the simple Kuznets curve would suggest. In the reduced form, the turning point is reached at 990 per capita (1990 GK\$) which is roughly the levels of Kenya and Nepal. Whereas, accounting for distinctive national characteristics, the equalizing trend only begins at development levels greater than 3100 per capita (1990 GK\$) – e.g. Ukraine, Philippines and Morocco in the 2000s.

Interpreting the results, we see that raising *Transfers* by 10 GDP percentage points (p.p.) reduces net inequality from 2.69 to 4.68 gini points, and the effect is significant at 1% level. Increasing average tax rate progressivity by 1 standard deviation declines inequality by 2 gini points (0.2 gini standard deviations), on average (significant at 5% level). Moreover, if *State* consumption grows 10 percentage point, in terms of GDP, inequality shrinks by 3 percentage points. Although this effect is significant at 1% level, contrary to the impact of *Transfers* and the *Tax System*, it is no longer noteworthy once we account for the political regime. In line with literature, we find that *Socialist* countries have on average 7 to 8 gini points less inequality than in countries with similar levels of development.[47] This signifies almost one standard deviation less which would be equivalent to Portugal – one of the most unequal OECD countries – achieving the level of Norway's net income inequality.[48] Finally, if *FDI* liabilities increase by 10 p.p relative to GDP net inequality widens by 2.44 percentage points.

We find evidence of an inverted Kuznets curve when we regress it on the *IER*, significant at 1% level. Note that *Income* is endogenous as the *IER* is a decreasing function of the economy's GDP per capita.[49] This explains the higher explanatory power of its specifications and the negative coefficient of *Income*. However, one does not expect to see a significant quadratic relationship. According to (6), there is a turning point – estimated to be roughly 25600 per capita (1990 GK\$) – from which inequality extraction starts increasing. Looking at the countries that are beyond this threshold, it suggests that inequality has been rising, with income accruing to those at the top of the distribution, in many OECD countries, since the late 1990s.

5.2 Neoliberal Paradigm: Inequality Main Determinants

Our results from Tables 3 and 4 show that labor market reforms, that took place since the 1980s, have been one of the main drivers for the increase in global income inequality.[50] This effect is significant at 1% level in most of the specifications and robust to the inclusion a myriad of controls. Note that *L.M. Deregulation* is always regressed together with *Unemployment*, avoiding any endogeneity issues arising from the possibility that labor

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[47]Boswell and Chase-Dunn, 2000; Heyns, 2005.

[48]OECD report (2008); Moreover, in our database Norway has the lowest net gini coefficient (=22) from all OECD countries, while Portugal (net gini above 36) is second most unequal European country, after Latvia.

[49]see the Appendix. If the maximum feasible gini is a positive and concave function of Income per capita, the former will increase with the latter but by less and less. Since the *IER* is the ratio of the gini over this maximum, *IER* will converge to the gini as Income per capita goes to infinity and *IER* should decrease by less and less. Thus, there should not be higher *IERs* for higher GDP per capita levels.

[50]Consistent with OECD report (2008) which argues that developments in these markets are the main source of changes in income.

regulation may increase the latter.[51] These findings evidence that labor deregulation degrades income distributions (Calderon et al., 2009; OECD, 2011) and increases the share of the richest 10% (Dabla-Norris et al., 2015).

Unemployment is also an important determinant of the upturn in inequality, having a larger widening impact on gross income inequality: a 1 percentage point increase in the unemployment rate can raise market inequality by up to 0.3 gini points.[52] Despite the reduced redistributive power of welfare states,[53] we find that a larger Government is associated with a more equal income distribution, always having a negative coefficient and being significant in about half of our specifications. One percentage point increase of its size relative to GDP can decrease net inequality and the share of the top 10% by more than 0.1 percentage points, significant at 1 percent level. As expected, the effect of Government in gross income inequality is not significant, whereas it is significant in all specifications of net inequality.

Consistent with the findings of Jaumoutte (2013) and the predictions of Perotti et al.(2007), we find that *Financial Openness* increases income inequality. The rise of the weight of the financial systems mainly increases market income inequality, being significant at 1% in all specifications. An increase of one standard deviation increases inequality by up to 5.3 percentage points. Furthermore, in line with the literature we find evidence that globalization (KOF) was another major determinant of increasing income inequality around the world, in the post-1980 period.[54] Increasing the overall KOF index by one standard deviation increases inequality from 3.5 to 4.6 percentage points. Its largest differentiating effect is found on the Inequality Extraction Ratio, significant at 1% level, and no evidence was found on its influence on the share of the top decile. Interestingly, political and social globalization appear to have been equalizing forces of income distributions worldwide, although having a smaller coefficient than the broad measure of globalization. Our results contrast with Bergh and Nilsson (2010) who suggested that the positive association between globalization and inequality is driven by its social component.

A surprising result is the significant positive association democracy has with the income share of top deciles. Due to lowering turnouts in elections, the median voter theorem does not have a direct application, and it is more likely that those who vote are the ones who see their views influencing political outcomes (Stiglitz, 2012). In turn those at the top have more influence on political decisions, lobbying to their benefit and preventing redistribution (Barro, 2000). Thus, Stiglitz (2012) argues that the "current system seem to operate on one dollar one vote instead of one person one vote". Our results are consistent with those of Carter (2007) who finds positive significant coefficients for the quadratic of political and civil liberties indexes.

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[51]Note also that the correlation between both variables is close to zero in all our models.

[52]"The single most obvious feature distinguishing the recent decades from those after the Second World War is the level of unemployment." (Atkinson, 2015).

[53]"The redistributive power of the welfare state was weakened in the period between the mid-1990s to mid-2000s. While in the period between mid-1980s and mid-1990s the share of increased market income inequality offset by taxes and transfers was measured at the level of almost 60%, this share has declined to around 20% by the mid-2000s." by Frster et al. (2015), "Cross-Country Evidence of the Multiple Causes of Inequality Changes in the OECD Area, in Anthony B. Atkinson and Franois Bourguignon, Handbook of Income Distribution, vol. 2B (Amsterdam: Elsevier, 2015, quote p. 1803).

[54]Dreher and Gaston (2008) analyzing OECD countries, for the period 1970-2000; Bergh and Nilsson, 2010 using 80 countries in the period 1970-2005; Atif et al. 2012 for 68 countries in the years 1990-2010.

While human capital is found to have equalizing effects in developing countries,[55] the coefficient is positive for advanced economies.[56] According to human capital investment theory, the effects are conditional on the rate of return to education – i.e. skill premium (Mincer, 1958). Firms' adoption of labor saving technologies and outsourcing production, coupled with increasing cost of education (Rajan, 2015), raised the skill premium in developed countries (Feenstra and Hanson 1996). On the other hand, developing countries have lower human capital levels, hence higher education could be decreasing the skill premium, lowering income inequality.[57] Assuming interest rates do not change, inflation benefits borrowers and hurts savers because the value of money decreases. Richer agents typically have better credit conditions and resort to loans to regularly invest their savings. As expected, inflation is found to increase the share of the top decile and significantly increases most measures of inequality. Consistent with Li et al. (1998), the Kuznets explains poorly inequality within countries.[58] Similarly to the results of Asteriou et al. (2014) and opposing to Jaumotte (2013) main finding for inequality drivers, technology is not significant in any specification.

Separately regressing the full specification on the subsample of advanced economies and on the subsample of developing countries, we find that our globalization results only remain for the latter while in advanced economies the effects are not significant. These findings are directly at odds with the H-O predictions and in line with numerous papers in the literature (see footnote 16). Although *Financial Openness* loses significance for advanced economies, it is always positive and significantly increases market inequalities by a similar amount. On the other hand, in emerging and developing countries, 1 percentage point increase of the latter increases the net gini by up to 5 points, market inequalities widen by more than 6.2 points, and the elite extracts circa 8 percentage points more (*IER*), all significant at 1% level. *Labor Market Deregulation* significantly increases the share of the *Top 10%* twice as much in the developing countries than in advanced economies, significant at 1% level. On the contrary, *Unemployment* has a more relevant impact on advanced economies, except for the positive effects on the top decile. Using the developing countries subsample, the effects on top deciles are significant in all specificantions whereas for advanced economies only in the reduced form. *Government* has a more important equalizing role in advanced economies, not being significant for developing countries. Interestingly, *Democracy* significantly increases all four measures of inequality in advanced economies with coefficients close to 1, while it only increases the top decile in the rest of the world. Finally, we run the same specifications using the 5 quintiles as dependent variables. Quintile regression analysis provides robustness for our results. Effects of L.M. Deregulation, Unemployment and Government are significant most of the times, show a positive coefficient (negative for Government) for the 5th quintile and have the opposite sign for all other quintiles.[59]

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[55]Calderon et al., 2009; Acemoglu and Robinson 2002; Engerman et al., 1998.

[56]Dabla-Norris, 2015; Mastromarco et al., 2011; Bergh et al., 2010; Barro, 2000.

[57]Checchi (2001), using a panel of 94 countries (developed and developing), found that years of schooling and inequality follow a U-shaped relation with a lower turning point at 6.5 years.

[58]see the Appendix for the complete specification results: Both income regressors are not significant. Moreover, urban population and shares of employment in agriculture and industry are not significant, while the theory would predict a negative sign for the share of agricultural employment and a positive one for the other two.

[59]Refer to the Supplementary Appendix for the complete separate subsamples regressions and Quintile regressions.

Table 3: Main Determinants of Global Income Inequality (IER and Top 10%)

Country Fixed Effects	Inequality Extraction Ratio					Top Income Decile				
	(1) Reduced Form	(2) Globalization	(3) Political	(4) Sociopolitical	(5) Full Controls	(6) Reduced Form	(7) Globalization	(8) Political	(9) Sociopolitical	(10) Full Controls
L.M. Deregulation	0.873*** (0.179)	0.826*** (0.177)	0.816*** (0.184)	0.403** (0.190)	0.479*** (0.171)	0.741*** (0.137)	0.782*** (0.142)	0.790*** (0.136)	0.553*** (0.152)	0.440** (0.180)
Unemployment	0.149*** (0.0465)	0.106** (0.0506)	0.117** (0.0514)	0.140** (0.0608)	0.0318 (0.0602)	0.133*** (0.0326)	0.110*** (0.0371)	0.0871** (0.0342)	0.118*** (0.0360)	0.103 (0.0622)
Government	-0.0626 (0.0527)	-0.0671 (0.0532)	-0.0715 (0.0511)	-0.100** (0.0483)	-0.0827* (0.0469)	-0.0661 (0.0488)	-0.0671 (0.0480)	-0.0553 (0.0443)	-0.110*** (0.0357)	-0.0604** (0.0277)
Financial Openness		0.543*** (0.149)	0.470*** (0.126)	0.502 (1.164)	0.472 (1.138)		0.209** (0.0892)	0.200** (0.0903)	0.143 (0.539)	0.650 (0.854)
Globalization		-0.0384 (0.0457)	-0.0485 (0.0525)	-0.0726 (0.0884)	0.247*** (0.0892)		0.0226 (0.0407)	0.0315 (0.0494)	-0.0520 (0.0800)	0.0286 (0.0930)
Political Controls										
Political Globalization			0.00740 (0.0325)	-0.0134 (0.0357)	-0.0969*** (0.0326)			-0.0201 (0.0304)	-0.0119 (0.0356)	-0.0224 (0.0406)
Democracy			-0.0285 (0.132)	0.0349 (0.128)	0.0632 (0.183)			0.159** (0.0614)	0.150* (0.0829)	0.217* (0.119)
Social Controls										
Social Globalization				-0.0103 (0.0415)	-0.122*** (0.0368)				0.0532 (0.0424)	-0.0354 (0.0527)
Human capital				-9.111*** (3.240)	-3.870 (3.078)				-2.389 (3.954)	-0.742 (5.279)
AE*Human Capital				10.68*** (3.010)	6.611 (4.484)				3.301 (2.680)	-0.356 (5.531)
Economic Controls										
Technology					0.332 (0.246)					-0.112 (0.251)
					(0.361)					(0.262)
Inflation					2.682** (1.262)					2.653* (1.468)
Time Fixed Effects										
Observations	1250	1078	965	848	673	795	671	597	520	444
Countries	115	110	105	91	87	98	94	86	73	69
Adjusted R^2	0.174	0.166	0.170	0.318	0.455	0.217	0.195	0.184	0.267	0.272

Table 4: Main Determinants of Global Income Inequality (Ginis)

	Net Income Inequality					Market Income Inequality				
	(1) Reduced Form	(2) Globalization	(3) Political	(4) Political + Social	(5) Full Controls	(6) Reduced Form	(7) Globalization	(8) Political	(9) Political + Social	(10) Full Controls
Country Fixed Effects										
L.M. Deregulation	0.669*** (0.159)	0.620*** (0.153)	0.589*** (0.155)	0.335** (0.160)	0.427*** (0.154)	0.680** (0.261)	0.545** (0.262)	0.461* (0.278)	0.0434 (0.269)	0.159 (0.184)
Unemployment	0.138*** (0.0421)	0.108** (0.0426)	0.0985** (0.0465)	0.0968* (0.0523)	0.00328 (0.0520)	0.290*** (0.0625)	0.214*** (0.0710)	0.183** (0.0796)	0.178** (0.0774)	0.0633 (0.0730)
Government	-0.0956* (0.0514)	-0.0905* (0.0503)	-0.0892* (0.0505)	-0.105*** (0.0397)	-0.0809** (0.0379)	-0.0361 (0.0611)	-0.0240 (0.0615)	-0.0223 (0.0617)	-0.0574 (0.0497)	-0.0588 (0.0393)
Financial Openness		0.337*** (0.124)	0.293** (0.121)	0.221 (0.944)	0.751 (1.067)		0.650*** (0.184)	0.624*** (0.175)	1.970*** (0.591)	3.437*** (0.924)
Globalization		-0.000724 (0.0409)	-0.00652 (0.0489)	0.0160 (0.0755)	0.216*** (0.0786)		0.0264 (0.0568)	0.0453 (0.0665)	0.0799 (0.101)	0.189** (0.0835)
Political Controls										
Political Globalization			0.00932 (0.0274)	-0.0211 (0.0303)	-0.0905*** (0.0279)			-0.0165 (0.0464)	-0.0735 (0.0451)	-0.0950*** (0.0294)
Democracy			-0.00253 (0.112)	0.00524 (0.101)	0.0397 (0.158)			-0.00864 (0.130)	0.0201 (0.121)	0.0400 (0.191)
Social Controls										
Social Globalization				-0.0348 (0.0372)	-0.137*** (0.0350)				-0.0677 (0.0539)	-0.128** (0.0543)
Human capital				-9.000*** (2.765)	-5.922* (2.984)				-7.914** (3.259)	-6.990** (3.377)
A.E.*Human Capital				7.947*** (2.548)	8.780** (4.338)				8.850*** (3.141)	16.41*** (4.887)
Economic Controls										
Technology					0.329 (0.255)					0.268 (0.288)
Inflation					2.378** (1.048)					1.815 (1.373)
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1250	1078	965	848	673	1250	1078	965	848	673
Countries	115	110	105	91	87	115	110	105	91	87
Adjusted R-squared	0.161	0.150	0.150	0.320	0.351	0.213	0.189	0.180	0.320	0.389

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5.3 Quasi-Experiment: Liberalization of Eastern Bloc

Table 5: Difference-in-Difference for Eastern Bloc Liberalization

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Net Gini Coefficient				Market Gini Coefficient			
	OLS	Subsample	Fixed Effects	Compiled	OLS	Subsample	Fixed Effects	Compiled
Transition	6.648***	4.570***	4.280***	4.961**	8.895**	8.240***	7.584***	7.784*
β	(1.935)	(1.551)	(1.197)	(2.340)	(3.340)	(2.720)	(1.825)	(3.917)
Pre-1990 Group Diff.	-5.013*	-5.301*		-8.992***	-6.360	-5.715		-8.465*
ρ	(2.510)	(2.927)		(3.023)	(4.068)	(3.665)		(4.578)
Western Time Diff.	4.324***	4.015***	4.075	8.531***	2.963*	3.250**	0.801	5.452***
γ	(1.202)	(0.852)	(5.304)	(1.722)	(1.532)	(1.502)	(5.935)	(1.429)
Placebo	1.514	0.121	1.22	1.1	1.96	0.912	2.378	0.151
Pre- and Post- 2000	(1.450)	(1.109)	(1.060)	(1.204)	(1.863)	(1.487)	(1.70)	(1.736)
Observations	844	559	844	844	844	559	559	844
Countries	33	33	33	33	33	33	33	33
Years	1970-2011	1985-2005	1970-2011	1970-2011	1970-2011	1985-2005	1985-2005	1970-2011
R^2 Transition	0.391	0.395	0.363	0.615	0.405	0.323	0.458	0.526
R^2 Placebo	0.283	0.357	0.324	0.212	0.314	0.265	0.435	0.236

The Difference-in-Difference analysis presents some interesting results. We find evidence of a causal effect of the liberalization of the Eastern European Bloc on both measures of income inequality. The transition to a market-oriented economy, which marked the change in paradigm in the early 1990s, significantly increased net income inequality by 4.3 to 6.7 percentage points whereas market income dispersion expanded by more than 7.5 percentage points. We argue that underlying effects of this *Transition* are associated with our main findings of Section 5.2, which can be seen in Figure 4 (Appendix). The change in paradigm had larger impacts in terms of market income inequality, amplifying market gini up to circa 9 percentage points (significant at 5%). This is not surprising since gross income distributions tend to have a higher variance and because these countries have a legacy of broad welfare states which continued to redistribute, compensating for the fall in collective bargaining.

It is interesting to note that the OLS estimated inequality causal effect of the transition is very similar to the predicted world average equalizing effect of a *Socialist* regime, in (4) of Table 2.[60] All transition (β) effects are significant at conventional levels and mostly at 1% level. As expected, employing Duflo et al.(2004) recommendation of compiling the data into two periods substantially increases the standard errors, decreasing the coefficient's significance. Although the transition's impact on inequality is robust for both measures of inequality, results for market income dispersion are less sensitive to methodology's differences.[61]

Consistent with our findings of Section 5.1, results indicate that before the transition, to what Kotz (2015) considers neoliberal-capitalism, the Eastern countries had significantly lower levels of inequality (after transfers and taxes) than the Western countries: $\rho < 0$. We also find evidence of the latter in terms of market inequality once we aggregate

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[60]Note that both OLS estimations have the net gini coefficient as the dependent variable and both effects are significant at 1% confidence level.

[61]Employing Double-Differences analysis using unbalanced panels, differences between OLS and FE estimations might arise from time-varying panel non-response. Under these conditions, OLS methodology is more efficient than Fixed Effects (Lechner et al., 2015).

Figure 2: Inequality Evolution: West vs East
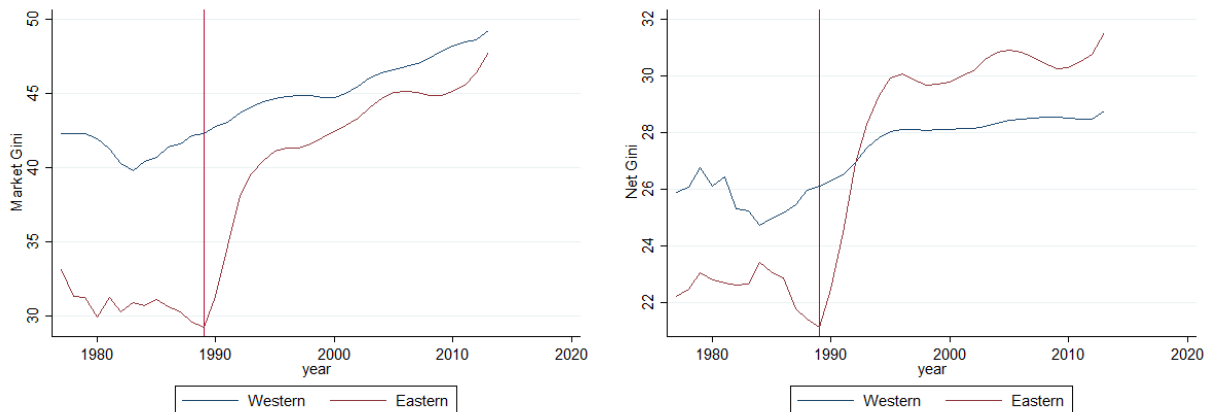
pre- and post- 1989 data, significant at 5% level. Another result which corroborates Figure 2 is the increase of both inequality measures in Western countries: $\gamma > 0$, although not significant in fixed effects estimations. This upturn of inequality in the control group occurred in the early 1980s, while for the treatment group it happened exactly in the year the Berlin wall fell (1989, transition year). Additionally, the placebo's quasi-experiment "treatment" effects are insignificant in all specifications and their explanatory power is always lower. This points to a good identification strategy of our Difference-in-Difference methodology (Gertler et al., 2010).

Literature on the use of this quasi-experiment design for the impacts on income inequality is relatively scant.[62] Using the same natural experiment of former soviet countries, Mahutga and Bandelj (2008) found robust evidence that the transition enlarged inequality through inflows of FDI. Also consistent with our inequality concerns from the neoliberal paradigm, the authors found that income dispersion increased more in post-socialist that privatized more and reduced the role of government in the economy (Mahutga and Bandelj, 2010).[63] To the extent of our knowledge, this is the first paper to explore the income inequality consequences of the transition of the Central and Eastern European countries, using Double-Differences methodologies.

[62]Other papers have explored the German re-unification as an exogenous variation for the application of Double-Differences approach. For example, Gebel and Voemer (2014) investigate the effects of the transition between employment and unemployment on health; and Buettner (2007) estimates the effects on employment and wages.

[63]Brune et al. (2004) defend that privatization is intrinsically a neoliberal policy idea.

6 Can we explain Atkinson's Inequality Turn?

Figure 3: Main Determinants of Inequality
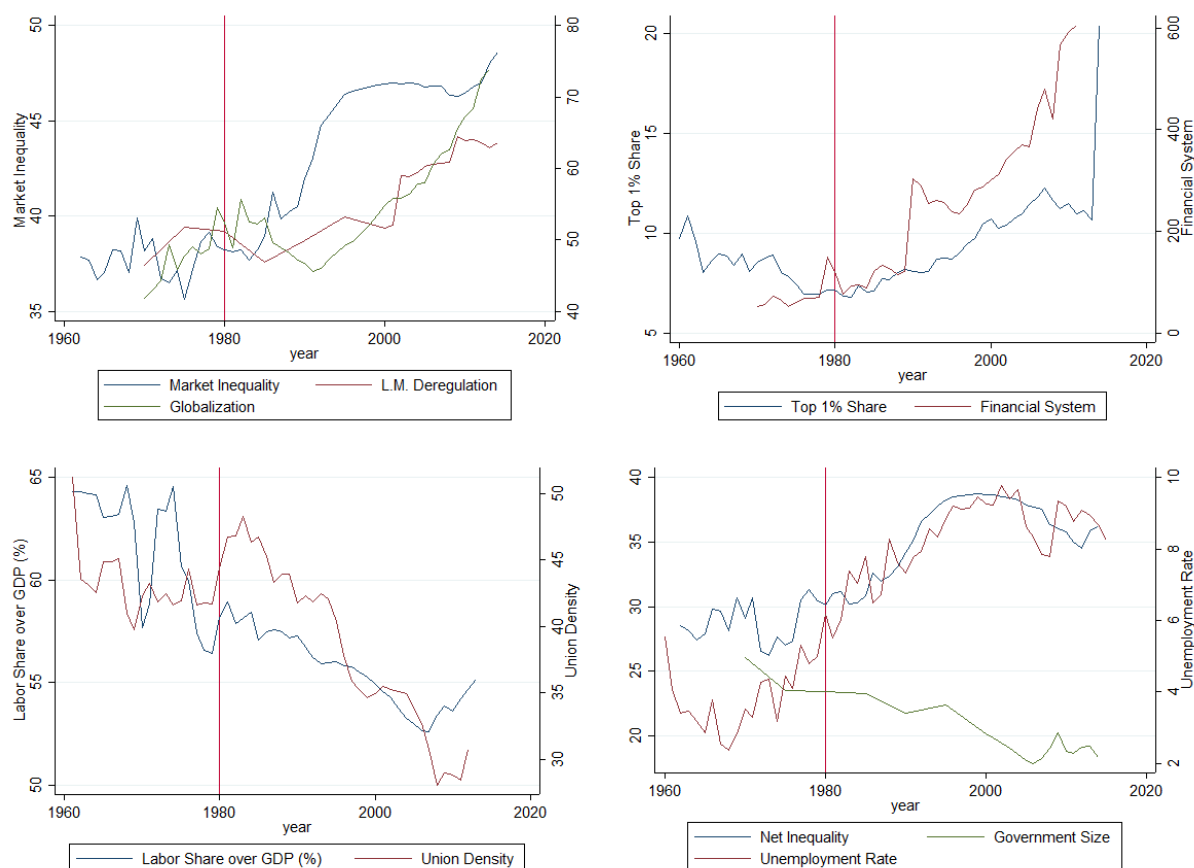
Interestingly, my results lend empirical support to a number of theories put forward by authors such as Atkinson, David Kotz, Stiglitz and Robert Reich. The determinants of income inequality found in Section 5.2 are associated with a series of structural reforms that are better understood given a brief historical context.

After the Second World War, the dominant economic school of thought perceived the state as a major player in the economy. Focusing on aggregate demand, Keynesianism saw no automatic mechanism to ensure full employment or fair distribution of income, arguing that governments should act in case of market failures, namely through fiscal and monetary policy. These ideas had their peak in the 1960s and prevailed throughout what some authors call the "Golden Age of Capitalism" (Marglin and Schor, 1990). Indeed, Maddison (1995) found that period - from late 1940s until early 1970s - to be have the highest growth rates, worldwide, since 1820.

Besides growth, the immediate post-war period recorded low levels of inequality arising from a new set of social attitudes and a greater sense of social solidarity (Atkinson, 2015). Goldin and Margo (1992) described it as the "The Great Compression" as not only top income shares fell homogeneously in all OECD countries but many European countries saw their gini falling 4-10 percentage points.[64] Under the economic system which Kotz

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[64]The authors defend that this compression, in the US, is not so much explained by SBTC but rather

defined as regulated-capitalism, inequality declined thanks to sharp increase of women participation (percentage of working married women more than doubled between 1947 and 1977), rapid growth of government transfers (doubled between 1955-70 relative to national income), progressive taxation (US top income tax rate averaged 75% between 1950-79), collective bargaining and government intervention in labor markets (Atkinson, 2015).[65] Moreover, during this "Great Prosperity", wages of lower-income Americans grew faster than those at or near the top (Reich, 2010).

However, the previous paradigm saw its end after the global oil crisis of 1973, with the collapse of Bretton Woods and the failure of fiscal and monetary policies to control unemployment, increasing inflation even more. Rooted on the ideas of Hayek and Friedman, and implemented mainly by Reagan, Thatcher and Greenspan: liberalization, privatization, and stabilization took over.[66] Globalization and technological progress reduced the share of wages (Reich, 2010), while financial markets became a dominant power with deregulation (Arrighi, 1994; Dumenil and Levy, 2004). These series of complex structural reforms, associated with financialization (Epstein, 2005), marked the beginning of the neoliberal paradigm where "market relations and market forces operate relatively freely and play the predominant role in the economy" (Kotz, 2015). In the UK, just within the last 6 years of the 1980s, the equalizing effect of transfers to lessening the gini coefficient fell by 8 percentage points (Atkinson, 2015).

What Atkinson called the *Inequality Turn*, in post-1980 years, coincided with the shift of the global politico-economic paradigm and with the proliferation of the "Washington Consensus", so criticized by Stiglitz (2002, 2015) and others (Rodrik, 2006; Reinert, 2000).[67] Looking at the global trends in Figure 3, we see this *Turn* of market (increased 7 percentage points) and net inequality (by 5 percentage points) beginning in the early 1980s, followed by the process of globalization (KOF increased from 45 to 75), labor market deregulation (increased by one standard deviation), persistently high unemployment (above 6%) and government downscale (lower than 20% of GDP). Moreover, the weight of financial systems relative to GDP tripled in the early 1990s, and nowadays, represent roughly 600% of the world's GDP. This trend was followed by rising top 1% and top 10% shares of income, beginning in 1980s. Finally, the declining share of labor compensation followed a similar path of the sharp reduction in union membership rates.[68,69]

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that it was achieved mainly due to institutional changes, point out to reforms like the National Industrial Recovery Act (1933) and the National War on Labor Board (1940s).

[65]Kotz defined it as the form of capitalism operating between 1948 and 1973 under the Bretton Woods system, moderately open economy but with capital movement constraints, regulation of financial sector which mainly provide financing for businesses and households, anti-trust enforcement, welfare state, progressive taxation and a major role of collective bargaining.

[66]"Stabilize, privatize, and liberalize became the mantra of a generation of technocrats who cut their teeth in the developing world and of the political leaders they counseled" (Rodrik, 2006).

[67]"(...)a set of policies predicated upon a strong faith – stronger than warranted – in unfettered markets and aimed at "reducing, or even minimizing, the role of government." (Stiglitz, 2015).

[68]Checchi et al. (2010) found that increasing wage shares by 1 p.p. leads to a reduction on 0.7 gini poins, in a sample of 16 OECD countries for the period 1970-1996.

[69]Which is higher than actual wage shares, as it accounts for what employers contribute for pensions, social and health insurance (Bernstein, 2013). Karabarbounis et al. (2014) found that the share of wages declined in 42 out of 59 developed and developing countries. Piketty (2013) showed that after steady increases of wage share between 1950 and 1970, in all countries with adequate data (except for Japan), there were decreasing shares between late 1970s and 2000s. Conversely, the author showed that capital's share of total income enlarged in most OECD countries, between 1970 and 2010.

7 Conclusion

This research investigates the main drivers behind the *Inequality Turn* which marked the increase of global income inequality, in the post-1980 period, using a panel of more than 100 countries, over the period 1960-2015. We find that structural reforms arising from the global proliferation of neoliberal-capitalism are associated with the rise of income inequality, around the world.

Our results show that deregulation of labor markets, downscaling of the role of governments in the economy and the rise of unemployment to persistently high levels, increased income disparities within countries. Moreover, the process of globalization and the sharp increase in the weight of financial markets over the real economy, in the late 1980s, contributed for the widening of income distributions – particularly in developing countries and in terms of market inequalities. Interestingly, the social and political components of globalization have been equalizing forces, though with small offsetting effects. Analyzing the effects on separate subsamples (advanced economies and the rest of the world) we find evidence against the Heckscher-Ohlin theory. This examination demonstrates that the positive association between democracy and inequality measures is stronger in advanced economies – crony capitalism might be operating in some OECD countries. These results suggest that institutional changes are a better explanation for the rise of inequality than the "skill-biased technological change" proposition.

Investigating the relationship between growth and inequality, we find evidence of the Kuznets Curve relationship: at earlier stages of development, inequality tends to increase with growth while at later stages of progress there are equalizing forces at work. We also find evidence that the inclusion of idiosyncratic policies and institutions are paramount for the study of this relationship and that the turning point occurs at higher GDP per capita levels than the simple Kuznets would suggest. Results also indicate the presence of an inverted curve for the Inequality Extraction Ratio. This may suggest that in many OECD countries, the elite could extract larger shares of possible inequality, since the 1990s. We also find robust evidence that the expose of the Eastern European countries, in the early 1990s, to the underlying paradigm of the worlds economy, substantially increased income inequality.

This paper entails the usual data limitations of cross-country studies, particularly arising from the reliability of inequality measures which encompass higher measurement errors. We mitigated this issue by using rigorous comparability selection criteria, ensuring a balanced tradeoff between comparability and coverage. What is more, due to the lack of theoretical and empirical frameworks for the study of inequality, our results might suffer from some degree of omitted time-varying characteristics. Two of these dimensions are the union density and the share of labor income which have been pointed out, by the literature, as important determinants.

One interesting avenue for further research is to investigate the extent to which these upturns in inequality and excessive shares at the top of income distributions have a causal impact on major financial crisis. Furthermore, using a smaller sample due to lack of data availability, it would be appealing to estimate the effects union membership and the falling shares of labor income have on income distributions. What is more, future papers could explore to what extent the drivers of income inequality explain global wealth dispersion.

8 Appendix

8.1 Inequality Extraction Ratio Derivation (Milanovic, 2010)

The Gini formula (Corrado Gini, 1912) for society with n groups with mean income y ordered in ascendant fashion $(y_j > y_i)$ is:

$$G = \underbrace{\Sigma_{i=1}^n G_i p_i \pi_i}_{\text{within inequality}} + \underbrace{\frac{1}{\mu}\Sigma_i^n \Sigma_{j>i}^n (y_j - y_i)p_i p_j}_{\text{between groups inequality}} \tag{5}$$

Where G_i is the inequality within the i-th social class, p_i is the proportion of people belonging to the i-th group and π_i is the proportion of total income received by that social class. If we imagine a society with just 2 groups – the elite $N\varepsilon$ and the rest $N(1-\varepsilon)$ – where each individual receives the same mean group income, N is total population and ε is the proportion of society that belongs to the elite (e.g. 0.1%). Then the within component disappears and formula simplifies to:

$$G = \frac{1}{\mu}(y_j - y_i)p_i p_j \tag{6}$$

Suppose further that everyone only receives the subsistence minimum income (s) whereas the elite extracts the entire surplus of total income (μN):

$$y_j = \frac{\mu N - sN(1-\varepsilon)}{\varepsilon N} = \frac{1}{\varepsilon}[\mu - s(1-\varepsilon)] \quad ; \quad y_i = s$$

Substituting these group mean incomes in equation (6) we arrive at the Inequality Possibility Frontier (IPF) function:

$$G^{Max}(\mu) = \frac{1}{\mu}\{\tfrac{1}{\varepsilon}[\mu - s(1-\varepsilon)]\}\varepsilon(1-\varepsilon)$$

Rearranging and re-writing the economy's mean income as a multiple of the subsistence level $\mu = \alpha s$, for $\alpha \geq 1$, we get the simplified expression for the maximum feasible inequality:

$$G^{Max}(\alpha) = IPF = \tfrac{1}{\alpha s}\{\tfrac{\alpha s}{\varepsilon} - \tfrac{s(1-\varepsilon)}{\varepsilon} - s\}\varepsilon(1-\varepsilon) = \tfrac{1}{\alpha s}\{\tfrac{\alpha s}{\varepsilon} - \tfrac{s}{\varepsilon}\}\varepsilon(1-\varepsilon) = \tfrac{\alpha-1}{\alpha}(1-\varepsilon)$$

Assessing the IPF at the limit, where the elite is infinitesimally small $(\varepsilon \to 0)$,

$$Lim_{\varepsilon \to 0}\tfrac{\alpha-1}{\alpha}(1-\varepsilon) = \tfrac{\alpha-1}{\alpha} = 1 - \tfrac{1}{\alpha}$$

and accounting for the different elasticities $\lambda_{IncGroup}$ with which the social minimum increases as mean income of the economy rises, we arrive at the expression used for the construction of the maximum gini in our panel of 157 countries:

$$G^{Max}(\alpha, \lambda_{IncGroup}) = 1 - \tfrac{1}{\alpha}\alpha^\lambda$$

The Inequality Extraction Ratio is simply the ratio between the "official" Gini and this maximum:

$$IER = \frac{G}{G^{Max}} \tag{7}$$

8.2 Complete Fixed Effects Regressions

Fixed Effects	Inequality Extraction Ratio					Top Income Decile				
	(1) Reduced Form	(2) Globalization	(3) Political	(4) Political + Social	(5) Full Controls	(6) Reduced Form	(7) Globalization	(8) Political	(9) Political + Social	(10) Full Controls
L.M. Flexibilization	0.873***	0.826***	0.816***	0.403**	0.479***	0.741***	0.782***	0.790***	0.553***	0.440**
	(0.179)	(0.177)	(0.184)	(0.190)	(0.171)	(0.137)	(0.142)	(0.136)	(0.152)	(0.180)
Unemployment	0.149***	0.106**	0.117**	0.140**	0.0318	0.133***	0.110***	0.0871**	0.118***	0.103
	(0.0465)	(0.0506)	(0.0514)	(0.0608)	(0.0602)	(0.0326)	(0.0371)	(0.0342)	(0.0360)	(0.0622)
Government	-0.0626	-0.0671	-0.0715	-0.100**	-0.0827*	-0.0661	-0.0671	-0.0553	-0.110***	-0.0604**
	(0.0527)	(0.0532)	(0.0511)	(0.0483)	(0.0469)	(0.0488)	(0.0480)	(0.0443)	(0.0357)	(0.0277)
Globalization		-0.0384	-0.0485	-0.0726	0.247***		0.0226	0.0315	-0.0520	0.0286
		(0.0457)	(0.0525)	(0.0884)	(0.0892)		(0.0407)	(0.0494)	(0.0800)	(0.0930)
Financial Openness		0.543***	0.470***	0.502	0.472		0.209**	0.200**	0.143	0.650
		(0.149)	(0.126)	(1.164)	(1.138)		(0.0892)	(0.0903)	(0.539)	(0.854)
Political Globalization			0.00740	-0.0134	-0.0969***			-0.0201	-0.0119	-0.0224
			(0.0325)	(0.0357)	(0.0326)			(0.0304)	(0.0356)	(0.0406)
Democracy			-0.0285	0.0349	0.0632			0.159**	0.150*	0.217*
			(0.132)	(0.128)	(0.183)			(0.0614)	(0.0829)	(0.119)
Social Globalization				-0.0103	-0.122***				0.0532	-0.0354
				(0.0415)	(0.0368)				(0.0424)	(0.0527)
Human capital				-9.111***	-3.870				-2.389	-0.742
				(3.240)	(3.078)				(3.954)	(5.279)
AE*Human Capital				10.68***	6.611				3.301	-0.356
				(3.010)	(4.484)				(2.680)	(5.531)
Educational Inequality				0.0687	0.0384				-0.0274	0.0883
				(0.113)	(0.125)				(0.117)	(0.184)
Female Mortality				3.964*	8.750***				6.174**	9.505***
				(2.341)	(1.979)				(2.836)	(3.464)
Urban Population (%)				0.106	0.138				0.0648	0.124*
				(0.0957)	(0.0935)				(0.0463)	(0.0726)
Elderly Population (%)				0.341**	0.107				0.164	0.0538
				(0.169)	(0.268)				(0.195)	(0.308)
Population (millions)				0.0297	0.0533***				-0.0478***	-0.0679
				(0.0224)	(0.0160)				(0.0166)	(0.0469)
Lagged GDP growth					0.00579					-0.0124
					(0.0225)					(0.0425)
Log(GDP per capita)					-77.74***					2.457
					(19.02)					(20.62)
Log(GDP per capita)$\hat{2}$					4.435***					0.00867
					(1.112)					(1.114)
Log(Technology)					0.332					-0.112
					(0.246)					(0.251)
Log(Credit)					-0.771					-0.192
					(0.633)					(0.613)
Log(Agriculture)					-0.437					-0.773
					(0.404)					(0.858)
Log(Industry)					-1.312					-1.574
					(1.109)					(1.675)
Investment					0.878**					0.103
					(0.361)					(0.262)
Inflation					2.682**					2.653*
					(1.262)					(1.468)
Constant	32.70***	35.13***	35.65***	21.09	327.5***	26.90***	25.92***	25.78***	-0.208	-36.38
	(1.648)	(2.763)	(2.962)	(16.10)	(81.28)	(1.543)	(2.482)	(2.503)	(22.47)	(91.79)
Observations	1250	1078	965	848	673	795	671	597	520	444
Countries	115	110	105	91	87	98	94	86	73	69
Years	1980-2014	1980-2011	1980-2010	1980-2010	2000-2010	1980-2014	1980-2011	1980-2010	1980-2010	2000-2010
Adjusted R-squared	0.174	0.166	0.170	0.318	0.455	0.217	0.195	0.184	0.267	0.272

Fixed Effects	Net Income Inequality					Market Income Inequality				
	(1) Reduced Form	(2) Globalization	(3) Political	(4) Political + Social	(5) Full Controls	(6) Reduced Form	(7) Globalization	(8) Political	(9) Political + Social	(10) Full Controls
L.M. Flexibilization	0.669*** (0.159)	0.620*** (0.153)	0.589*** (0.155)	0.335** (0.160)	0.427*** (0.154)	0.680** (0.261)	0.545** (0.262)	0.461* (0.278)	0.0434 (0.269)	0.159 (0.184)
Unemployment	0.138*** (0.0421)	0.108** (0.0426)	0.0985** (0.0465)	0.0968* (0.0523)	0.00328 (0.0520)	0.290*** (0.0625)	0.214*** (0.0710)	0.183** (0.0796)	0.178** (0.0774)	0.0633 (0.0730)
Government	-0.0956* (0.0514)	-0.0905* (0.0503)	-0.0892* (0.0505)	-0.105*** (0.0397)	-0.0809** (0.0379)	-0.0361 (0.0611)	-0.0240 (0.0615)	-0.0223 (0.0617)	-0.0574 (0.0497)	-0.0588 (0.0393)
Globalization		-0.000724 (0.0409)	-0.00652 (0.0489)	0.0160 (0.0755)	0.216*** (0.0786)		0.0264 (0.0568)	0.0453 (0.0665)	0.0799 (0.101)	0.189** (0.0835)
Financial Openness		0.337*** (0.124)	0.293** (0.121)	0.221 (0.944)	0.751 (1.067)		0.650*** (0.184)	0.624*** (0.175)	1.970*** (0.591)	3.437*** (0.924)
Political Globalization			0.00932 (0.0274)	-0.0211 (0.0303)	-0.0905*** (0.0279)			-0.0165 (0.0464)	-0.0735 (0.0451)	-0.0950*** (0.0294)
Democracy			-0.00253 (0.112)	0.00524 (0.101)	0.0397 (0.158)			-0.00864 (0.130)	0.0201 (0.121)	0.0400 (0.191)
Social Globalization				-0.0348 (0.0372)	-0.137*** (0.0350)				-0.0677 (0.0539)	-0.128** (0.0543)
Human capital				-9.000*** (2.765)	-5.922* (2.984)				-7.914** (3.259)	-6.990** (3.377)
AE*Human Capital				7.947*** (2.548)	8.780** (4.338)				8.850*** (3.141)	16.41*** (4.887)
Educational Inequality				-0.0888 (0.0799)	-0.0203 (0.107)				-0.111 (0.0933)	-0.00532 (0.130)
Female Mortality				2.490 (1.920)	4.942*** (1.854)				4.042* (2.344)	9.831*** (2.155)
Urban Population (%)				0.0991 (0.0754)	0.103 (0.0854)				-0.0447 (0.120)	0.0553 (0.107)
Elderly Population (%)				0.273* (0.143)	0.160 (0.248)				0.887*** (0.282)	0.445 (0.354)
Population (millions)				0.0481** (0.0201)	0.0401*** (0.0131)				0.0509** (0.0236)	0.0254** (0.0127)
Lagged GDP growth					0.0119 (0.0193)					0.00233 (0.0210)
Log(GDP per capita)					0.616 (15.80)					29.06 (18.88)
Log(GDP per capita)²					0.140 (0.907)					-1.318 (1.076)
Log(Technology)					0.329 (0.255)					0.268 (0.288)
Log(Credit)					-0.564 (0.496)					0.652 (0.589)
Log(Agriculture)					-0.331 (0.306)					-0.0626 (0.320)
Log(Industry)					-1.238 (0.818)					-1.032 (0.884)
Investment					0.863*** (0.327)					1.059*** (0.346)
Inflation					2.378** (1.048)					1.815 (1.373)
Constant	30.70*** (1.515)	30.92*** (2.400)	31.06*** (2.562)	28.76** (13.43)	-4.637 (70.32)	37.05*** (2.623)	36.56*** (3.678)	37.71*** (4.130)	32.97* (17.88)	-165.0* (83.90)
Observations	1250	1078	965	848	673	1250	1078	965	848	673
Countries	115	110	105	91	87	115	110	105	91	87
Years	1980-2014	1980-2011	1980-2010	1980-2010	2000-2010	1980-2014	1980-2011	1980-2010	1980-2010	2000-2010
Adjusted R-squared	0.161	0.150	0.150	0.320	0.351	0.213	0.189	0.180	0.320	0.389

Figure 4: Inequality Drivers associated with the Transition
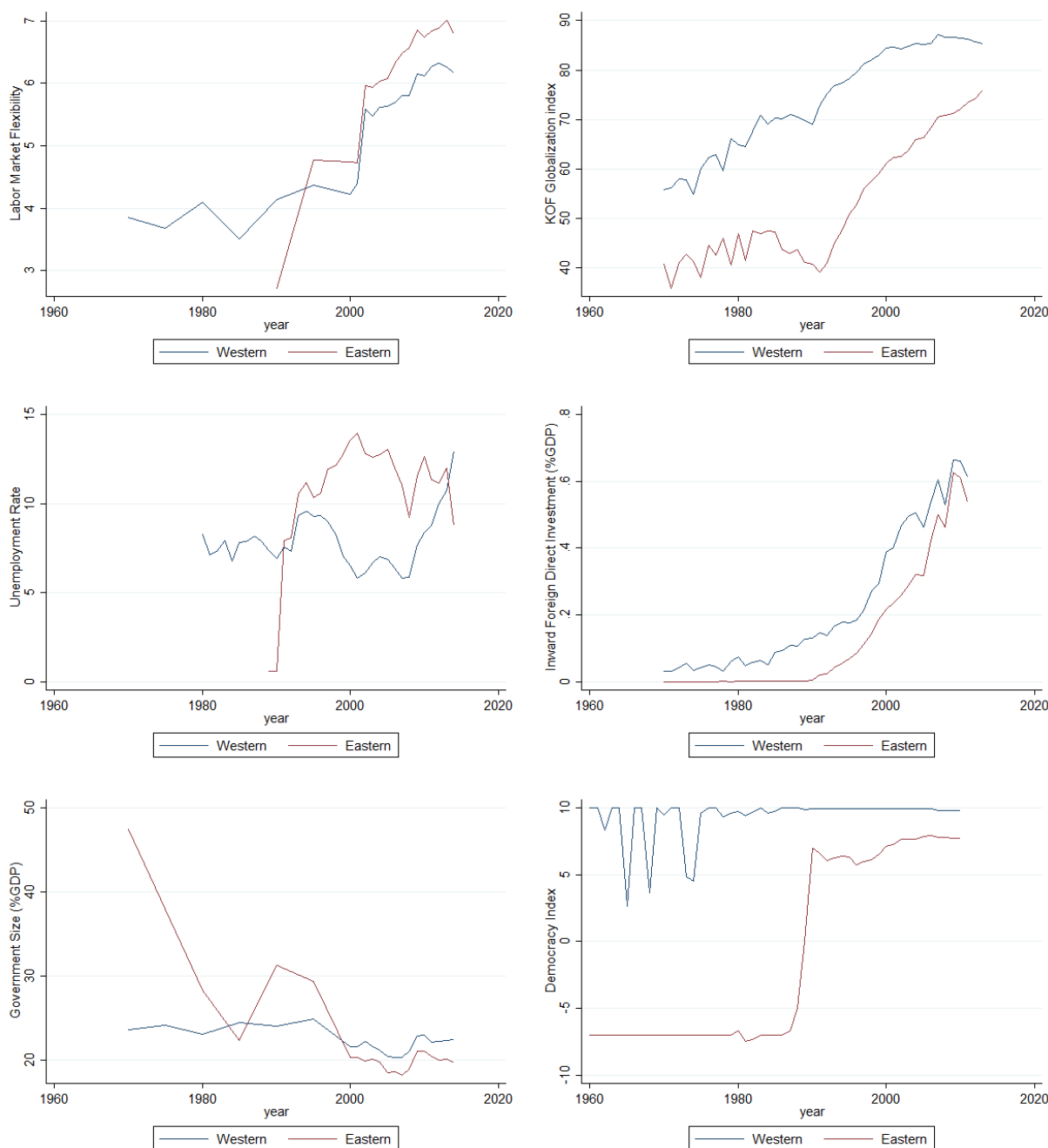
8.3 List of Socialist Countries in Dummy

China, Cuba, Lao, Viet Nam, Armenia, Azerbaijan, Belarus, Estonia, Georgia, Kazakhstan, Kyrgyz Republic, Latvia, Lithuania, Moldova, Russian Federation, Tajikistan, Turkmenistan, Ukraine, Uzbekistan, Afghanistan, Cambodia, Mongolia, Yemen, Bulgaria, Czech Republic, Hungary, Poland, Romania, Slovakia, Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Macedonia, Montenegro, Serbia, Slovenia, Angola, Benin, Ethiopia, Somalia and Mozambique.

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