The Debate on Globalization and Income Inequality:

Analyzing Branko Milanovic's Contribution to the Discussion

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1. Introduction

Does globalization lead to increased income inequality? Who are the winners and losers of globalization? These questions have received a lot of attention by politicians and societies throughout the world as a result of the Brexit vote, the election of president Trump, and the rise of populism in Europe. The relationship between globalization and increased income inequality is not an unfamiliar topic in literature and scholars have tried to examine this link before. Bergh and Nilsson (2010) argue that there is prevalent belief that globalization benefits economic growth at the expense of increased inequality within nations. Moreover, Maskin (2015) states that globalization creates inequality within developing countries because high skilled workers in these countries benefit from the influx of multinationals, and creating demand for their skills. The unskilled workers are left out and this leads to a widening gap between skilled and nonskilled workers. The World Bank (2015) recently published a report, which actually states that on a global level, inequality between countries has decreased over the last twenty years due to economic liberalization and integration. Finally, Lindert and Williamson (2003) mention a rise in income inequality driven by a widening income gap between nations, and not an increase of within-country inequality. They argue that the countries that benefitted from globalization are the ones that implemented policies leading to integration into the world economy, while the ones losing were left out and did not participate in the global economy. The discussion above indicates that globalization may have a different impact on income inequality within and between nations. As a result, in the existing literature the debate between globalization and income inequality remains unsettled.

In 2016, Branko Milanovic, a World Bank economist enters the inequality debate with his book *Global Inequality* and provides an explanation for the relationship between globalization and global inequality. He illustrates his argument by making use of the so-called 'elephant curve' which is displayed in Figure 1. This curve shows the growth in income of the global income distribution of the last twenty years and takes a curious shape: first sloping up, comes down and upwards again. The curve looks like an inverted S on its back or as many refer to it, an elephant raising its trunk which explains why many refer to it as the elephant curve. This curve was already published in a World Bank paper by Milanovic and Lakner (2013), but received more attention with the publication of his book. Paul Krugman (2015) states that the trend depicted in the chart would be "crucial for developments in the upcoming years". Furthermore, O'Brien (2016) mentions that "it is the most important chart for understanding politics today". The chart is now going around the world as many politicians and economists

try to find an explanation for the British referendum vote, the success of Trump and the emerging populist movements (Kawa, 2016). With this graph, Milanovic seems to have found an answer for these developments and argues that the incomes of the middle class in rich countries have stagnated. In short, Milanovic (2016) explains that over the past twenty years global inequality has decreased, but that the growth in income is not distributed equally within countries. Emerging Asian economies have experienced an enormous increase in income and this resulted in a rise of a new global middle class. Moreover, the top 1% of the global income distribution also significantly gained from globalization. Finally, "the biggest loser" of globalization is the middle class of rich countries as this group experienced almost no growth in income over the last two decades. The elephant curve represents the time period 1988-2008 and this reconciles with the rise of globalization during the late 1980s. Milanovic argues that the shape of this curve, and therefore the unequal gain in income within countries over the last two decades, is driven by the development of globalization.

Branko Milanovic provides a new and dominant perspective in the discussion of globalization influencing increased income inequality. He presents new insights on how global inequality has changed over the last twenty years and highlights the effect of globalization on income inequality both between and within nations. Recently, his work has received a lot of attention by other scholars and international media. For these reasons, it would be interesting to see how valuable his contribution is to the general discussion about the influence of globalization and income inequality. Therefore, the aim of this research is to investigate whether Milanovic's analysis about globalization and income inequality can provide an important contribution to answering the general question stated in the introduction: does globalization lead to increased income inequality?

This paper is structured in five main parts. First, it considers the methodology of this research in more depth. Furthermore, it discusses Milanovic's argument on the relationship between globalization and income inequality by considering his book *Global Inequality* and two articles of his preceding work. Subsequently, it provides an overview of what others have written in reaction to Milanovic's theory by performing a systematic review of existing literature. The next section critically discusses a selection of critiques and uses the global income dataset of Milanovic. In the concluding section, this paper formulates an answer to the question what Milanovic's analysis about globalization and income inequality has contributed to the general question of globalization leading to increased income inequality.

2. Methodology

The objective of this paper is to investigate what Branko Milanovic's analysis contributes to the general discussion of globalization and income inequality. This investigation consists out of four steps and is carried out as follows.

<u>Step 1: Literature retrieval process: Milanovic's work</u>

Milanovic's work on globalization and income inequality is discussed. This is achieved by performing a systematic review of Milanovic's preceding work and his most recent book, *Global Inequality*. A systematic review is a means of identifying, evaluating and interpreting all available research relevant to a particular research question or a certain field of interest (Kitchenham, 2004). This review is a type of methodology that enables to summarize existing literature on a specific research question, allows for identifying any gaps in current research and finally, it provides a comprehensive framework of previous performed research.

The systematic review allows for identifying all available work written by Milanovic alongside his book *Global Inequality*. This is useful since his book is a product of many years of research and by investigating into his preceding work this could provide more insights on how he derived at certain conclusions in his book. Furthermore, his book was only recently published in 2016. By considering his previous work, this subsequently widens the scope for the responses made by others (see step 2) since more articles can be looked at.

The review is performed as follows: after the discussion of Milanovic's book, the literature retrieval process of his preceding work is performed by the search of relevant publications of Milanovic in the database of Google Scholar. In total, there are 327 articles of Milanovic on Google Scholar and in order to conduct a meaningful review, the following criteria were defined in order to separate his most relevant articles from the rest of his work: since Milanovic talks about global income inequality and globalization, the articles also need to deal with these topics. The articles need to be published between the years 2013-2016 since 2013 is the first time the elephant curve appeared and 2016 is the year that his book was published. The articles are selected by reading the title and abstract. Based on these criteria, I selected two additional articles. First, Milanovic (2013) is the first article in which the elephant graph appears and discusses the changes in global inequality. The second article by Lakner and Milanovic (2013) provides a more in-depth explanation of the methodology they used in their paper, and the authors highlight the importance of the effect of globalization on

the global income distribution. Both articles are elaborated upon throughout Milanovic's analysis in section three of this paper.

Step 2: Literature retrieval process: reactions of scholars

This part of the systematic review makes use of the articles selected in step 1. The database of Google Scholar allows one to see per article which other scholars have cited the selected article. The review looks at all citations for the three selected pieces by Milanovic. For Milanovic's book there were 143 citations, 181 for the article of Lakner and Milanovic and the other article by Milanovic there were 241 citations. In order to get a meaningful review, the criteria of selecting the articles it they should deal with globalization and global income inequality between the years 2013-2017. The year 2013 is again the first year in which the elephant curve appeared and since Milanovic's book was only published last year, widening the scope to 2017 may potentially lead to more reactions from others. The articles are selected by reading the title, abstract and the text where Milanovic was mentioned. Subsequently, the context in which Milanovic is mentioned needs to relevant to his own analysis of globalization and income inequality. Based on these criteria, I have selected a total of 20 articles that fall between the time period of 2013-2017 and are relevant for Milanovic's analysis.

Step 3: Overview of reactions

After the selection of the relevant articles, the paper provides an overview of what the authors mention in reaction to Milanovic's analysis and is displayed in a comprehensive framework. The critiques are divided into a list of points that are relevant and could potentially influence Milanovic's analysis: data, methodology, the elephant graph, other factors and inequality patterns. The points are elaborated upon and explained how they could potentially influence Milanovic's analysis. In order to create a more comprehensive overview, a table is created that displays these above mentioned points and includes short sentences of the exposed critiques. The table shows the authors of the response, the year it was published, the source together with the main critiques.

Step 4: Critical analysis of reactions by others and statements made by Milanovic

In the next section, I provide my own view on Milanovic's analysis by providing a critical analysis of his work. I have selected a number of critiques and statements made by Milanovic in his work. This analysis takes a look at the following statements: data consistency, regional

composition of countries, the elephant curve and the role of globalization. This critical analysis is performed by verifying these statements and his critiques by making use of the dataset of Lakner and Milanovic, also referred to as the Lakner-Milanovic (2013) World Panel Income Distribution (LM-WPID) data. This dataset combines a number of national household surveys. Furthermore, it includes a panel of country-deciles that covers the period of 1988-2008, expressed in common currency and prices in 2005 $PPP (purchasing power parity). Finally, the aim is to evaluate how the observations made in this critical analysis influence Milanovic's hypothesis on globalization and income inequality, and finally, whether the data truly supports Milanovic's analysis.

In the conclusion, this paper provides a summary and draws a conclusion on the contribution of Milanovic's analysis about globalization and income inequality to the general discussion of globalization leading to increased income inequality.

3. Milanovic's theory

In his work, the World Bank economist Branko Milanovic tries to find an answer to the question: Does globalization increases inequality between and/or within countries? In his preceding work, Milanovic (2013) already provides an overview of calculations of global income inequality and focuses on the winners and losers of globalization in the most recent episode of globalization. This work, together with the World Bank paper written in collaboration with Lakner (Lakner and Milanovic, 2013), have contributed to his most recent book, *Global Inequality,* in which Milanovic continues to investigate the effects of globalization on the distribution of incomes in the world together with the changes in in global inequality. Milanovic (2016: p.2) argues that over the last twenty years global inequality is not driven by rising gaps between countries, but actually by a substantial increase in inequality within nations. Therefore, Milanovic (2016: p.3) defines global inequality in his book as follows: "Income inequality among the citizens of the world can be considered as the sum of all national inequalities plus the sum of all gaps in mean incomes among countries". This section zooms in on the development in income inequality over the last two decades that reconciles with the second wave of globalization during the 1980s.

Milanovic (2016: p.10) argues that first of all, the gains obtained from globalization are not evenly distributed. He illustrates this in the so-called elephant curve, with on the horizontal axis the percentiles of the global income distribution, and on the vertical axis, the relative growth in real income between 1988 and 2008 expressed in common currency and prices in 2005 $PPP's. The data used for this graph (Figure 1) is obtained through a combination of national household surveys coming from different sources since no global database on income inequality exists yet. The data Milanovic collected consists out income and consumption. Subsequently, income includes wages, self-employment income, assets, social transfers and direct taxes. Consumption data is defined as "money spent on everything from food and housing to entertaining" (Milanovic, 2016: p.12).

Milanovic (2016: p. 11) states that the period of 1988-2008 coincides with the fall of the Berlin Wall, the collapse of the communist regime, together with communication and technology advances that allowed for the relocation of factories to developing nations and thereby making use of cheap labor. These events represent a crucial period of accelerated globalization and as a result, developing countries started opening up their markets while developed countries started to outsource their production and made use of the cheap labor advantage.
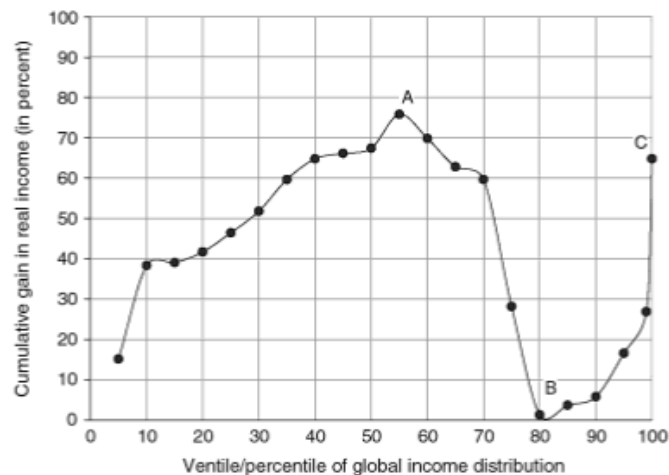
Figure 1: Relative gain in real per capita income by global income level
1988-2008. Data source: Lakner and Milanovic (2013)

Lakner and Milanovic (2013) indicate that it is important to study the effects of this high globalization period on the global income distribution. They argue that this crucial period of accelerated globalization has had an impact on the evolution of the global income distribution.

As mentioned before, according to Milanovic (2016: p.18), the gains of globalization are not equally distributed. This can be explained by points A, B and C. These points represent a different income group and they have all experienced differences in real income growth. Point A represents the middle income class of the developing countries and this group experienced the biggest increase in real income growth. This group is shaped by people in the middle class of the emerging Asian economies: China, India and Thailand, Vietnam and Indonesia. This group enjoyed the highest real income growth: around 80 percent during the last twenty years and are also referred to as the '"emerging global middle class" as this group is still considered relatively poor in comparison with the middle income class of the developed nations. Subsequently, there is point B and this group is richer than group A. However, as one can observe the value on the vertical axis is close to zero, meaning that this group almost experienced no growth in income whatsoever. This group is shaped by the lower middle income class of rich countries coming from Western Europe, North America, Japan and Oceania. Finally, point C is formed by the global 1 percent coming from the rich economies and their incomes have risen increasingly over the last two decades.

As a result, it seems that income groups have experienced different increases in income and one can thus make the following observation: the income gaps between the middle income class and the top within rich nations has widened. This means that income inequality within

rich nations has increased over the last two decades. The graph shows that the changes in income have benefitted the rich, the poor and not the ones in between. This rise in inequality within nations is also displayed by the increase in the Gini index for mature economies from 38.2 (1988) to 41.9 (2008) (Lakner and Milanovic, 2013). Interestingly enough, all regional Gini indexes increased over the last two decades, expect for Latin-America. This means that not only the mature economies, but also emerging economies have experienced a rise in within nation inequality. Based on Milanovic's definition of global inequality, this development would add to global inequality. However, the economic catch-up of Asia has actually reduced global inequality. As a result, the graph therefore suggests that overall global inequality may have decreased over the past two decades due to the rapid growth of the global middle class. Milanovic (2016: p.118) states that this observation seems to be supported by a drop in the global Gini coefficient from 72.2 (1988) to around 67 (2011).

After having explained the graph and the developments in global inequality, the question that remains is how globalization may have influenced this change? In order to answer this, the paper zooms in on two of Milanovic's chapters that deal with a more in depth analysis of within and between nation inequalities.

3.1 Inequality: within countries

In order to study inequalities within nations Milanovic makes use of so-called Kuznets waves. These waves are an extension of the Kuznets hypothesis, and the hypothesis assumes that the initial economy of a country only exists out of agriculture. When countries start to industrialize, inequality within nations tends to increase since industry workers receive a higher wage than farmers. In the long run, when more and more people move out of agriculture into industry, inequality will come down since scarcity of workers in agriculture will eventually push up their wages. This hypothesis is subsequently displayed in the Kuznets curve (Figure 2) below.
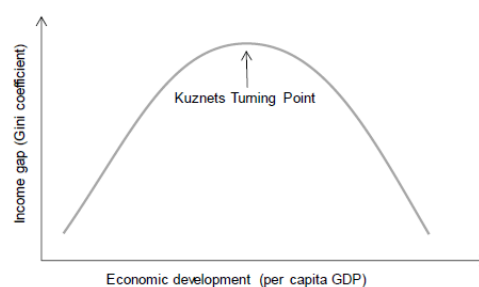

Figure 2: Kuznets curve. Source: Kwan (2014)

The curve shows that at low levels of economic development, inequality is also low, but increases when a country starts to develop up until the turning point. This represents the movement of workers from agriculture into industry. After this turning point, inequality will come down again influenced by the scarcity of farmers which drives up their wages. Inequality will continue to decrease over time when countries remain to grow in terms of GDP.

Milanovic believes that this curve fails to explain the current increase in inequality of developed nations. The Kuznets curve shows that once a country has developed in the long run, inequality will not increase again. He argues that inequalities can rise again over time even when a country is developed, and tries to illustrate this with the so-called Kuznets waves that alternate in increases and decreases in inequality. Milanovic makes use of historical events to support his argument and highlights that different events can lead to a rise and fall of inequality over time and this pattern of falling and rising alternates each other. As shown in Figure 3 different mechanisms and events over time have influenced alternating increases and decreases in inequality.
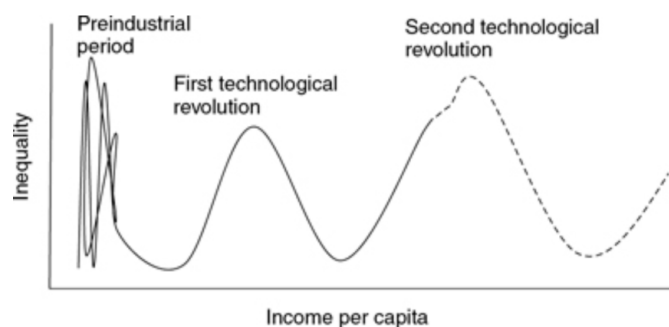
Figure 3: Kuznets wave. Source: Milanovic (2016)

Figure 3 represents a time period that displays the preindustrial period up until 2008. In the time of the preindustrial period, there was no relationship between mean income level and the level of inequality. This lack of relationship is represented by the sketches on the left side of the figure. Milanovic (2016: p.50) states that instead wages and inequality were driven up or down by idiosyncratic events such as epidemics, new discoveries, invasions and wars. With the Industrial Revolution, and the sustained increase in the mean income, the situation changed and wages generally increased with income. Milanovic (2016: p.53) argues that structural change and urbanization drove up inequality from the time of the Industrial

Revolution to a peak in rich countries which took place at the beginning of the twentieth century. After that point, inequality started to decrease, which was created by an increase of a more-educated labor supply, increase in demand for redistribution and the returns on capital decreased. The forces that drove down inequality came to an end by the 1980s and this is the beginning of the second Kuznets wave for rich countries in which these countries are currently located. Milanovic (2016: p.55) argues that three factors contributed to the increase of inequality by the end of the 1980s: technology, globalization (openness) and policy, also referred to as TOP. First of all, technological advances led to a shift from manufacturing to services. The service sector is more heterogeneous in terms of wages than manufacturing and therefore experiences higher wage dispersal caused by stronger rewards for high skilled labor which subsequently drove the increase in wage inequality. Furthermore, globalization caused an enormous increase in labor supply that became available for producers in rich nations, which also subsequently weakened the bargaining position of labor in developed countries. Finally, the new policies that started in the 1980s were according to Milanovic (2016: p.54) pro-rich, such as reducing tax rates for high incomes and taxing capital income at a lower rate than labor income. The underlying reason for this dealt with economic necessity. Milanovic (2016: p.55) highlights that in the era of information technology and globalization it becomes more difficult to control and tax mobile capital since it can easily move from one jurisdiction to another. As a result, the tax rates for capital remained low together with reduced tax rates for high incomes. This influenced an increase in inequality within nations between the rich and the poor, since the rich enjoyed the benefits from the reduced taxes. In short, Milanovic shows with these Kuznets waves that changes in inequality are a continuous process over time and are influenced by different events that lead to an alternating pattern of decreasing and increasing inequality.

In the next section of his book, Milanovic zooms in on the influence of skill-biased technological change and globalization. He argues that both factors influence the increase in (wage) inequality. First, Milanovic (2016: p.109) states that technology advances led to a lower price of capital goods and subsequently caused the replacement of low-skilled labor by capital in developed nations. As a result of this development, high-skilled jobs stay in developed nations and the shares of capital increase. In almost all modern capitalist societies, capital ownership is heavily concentrated. The rewards of capital end up in the hands of the few and the capital owners are the ones obtaining the large profits. However, as Milanovic (2016: p.110) indicates, this development of technological advances and subsequently, the

replacement of routine labor, could only have happened under the conditions of globalization. Globalization led to the use of cheap labor in Asia which subsequently led to reduced prices of producing capital goods. Companies decided to offshore their production of capital goods to developing nations because of the availability of cheap labor in Asia. As a result, this led to the disappearance of jobs in developed nations while high-skilled labor stayed behind. In order to further illustrate this argument of how globalization influences technological advances Milanovic (2016: p.110) discusses three sectors and their relationship: one sector builds capital goods in low-wage nations driven by globalization, one that uses these capital goods to get rid of low-skilled labor in developed nations that represents technological advances. Finally, as a result of these developments, a sector stays behind in developed nation that exists out of skilled labor and capital intensive goods.

In sum, Milanovic (2016: p.110) states that the technological advances could only occur since capital goods could be produced cheaper in low-wage countries due to globalization and were used to replace routine labor in developed nations. As a result, low-skilled jobs in developed nations disappear and at the same time, the production of luxury goods and services requires skilled labor which leads to an increased wage dispersal in rich countries. Milanovic (2016: p. 110) acknowledges that technological change and globalization are intertwined in explaining inequalities. He also states that effects of technology and globalization are difficult to observe separately since they seem to influence each other. This stresses the complexity of explaining increased income inequality. In addition, he adds that the three elements of TOP (technology, openness and policy), influence each other and all play a role in explaining the current developments in inequality. However, globalization still seems to have an impact on the increased inequalities within nations due to access of cheap labor in Asia.

3.2 Inequality: between countries
Inequalities between countries have decreased over the last twenty years. Milanovic (2016: p. 161) states that globalization has led to greater income growth in developing countries due to division of labor from the developed to the developing world. In addition, globalization made it easier to access technology, capital and buy goods they needed in order to develop. Milanovic and Lakner (2013) believe that globalization also has led to income convergence which is reflected in a slight decline of the global Gini index from 72 to 67 over the past twenty years. However, it should be noted that the increase in income for developing nations was not the same for all countries. For example, Latin America and Eastern Europe experienced during the era of high globalization large recessions and depressions.

Nevertheless, as Milanovic (2016: p. 170) argues, the biggest driver of this convergence is the fast economic growth of populous Asian countries. In particular, China comes across as the great equalizer. On a final note, Milanovic wants to make very clear that the world is not there yet, since there still remain huge gaps between incomes in Asia and the West.

After discussing Milanovic's work, one could state that according to Milanovic technological advances and globalization seem to have played a significant role in explaining increased income inequality within nations. Economic policies also influenced this effect, but received less attention in the work of Milanovic. In contrast, globalization appears to have reduced inequality between nations due to rapid income growth mainly driven by Asian economies.

4. Overview of reactions to Milanovic's work

Milanovic's work has contributed to our understanding of global income developments and how globalization together with technological change, has influenced income inequalities within and between nations. However, at the same time, Milanovic also received a great deal of critique on his work. In line with the aim of this research, it is important to consider the exposed critiques in order to investigate what others have written about him and whether this influences Milanovic's contribution to the discussion of globalization and income inequality. This section looks at these exposed criticisms by performing a systematic review and provides an extensive summary of the most important and relevant responses. Subsequently, table 1 provides a comprehensive overview of the responses to the work of Milanovic. The comments were classified into the following points: data, methodology, the elephant graph, other events influencing stagnation of income growth and finally inequality patterns. These points are most relevant for Milanovic's analysis and were also directly focused on his hypothesis of globalization and income inequality. Many other comments were made by performing the systematic review, but these were not directly focused on Milanovic's analysis and therefore fall beyond the scope of this research.

4.1 Data

In response to Milanovic, Adam Corlett argues in a report of the *Resolution Foundation* (UK social-policy think tank) that the data for countries is not used consistently in the time period of 1988-2008. He states that countries are not included in the first benchmark year while they are included in 2008 and also the other way around. Corlett (2016) illustrates that the elephant curve takes a different shape when a balanced sample of countries is used and shows that the growth levels for middle income groups of rich countries are higher than in the original unbalanced sample. In other words, this means that this group may have experienced higher growth than Milanovic argues in his analysis. Linden et al. (2014) find the dataset Milanovic uses throughout his work limited mainly because it only covers the period of 1988-2008 while globalization already occurred before.

4.2 Methodology

Several authors mention that Lakner and Milanovic (2013) adjust for top incomes. Lakner and Milanovic collected their data on income through the means of survey data, but this type of data collection led to underreporting of the top incomes. In order to obtain the data for these top incomes, they make use of national account (NA) means (Anand & Segal, 2014; Edward

and Sumner, 2015). National accounts represent output, expenditure, income activities of all economic sectors of a country together with relations with other economies, and also provide information about the nation's wealth. Furthermore, national accounts provide information on national income and subsequently, also information about the top incomes. According to Edward and Sumner (2015) and Anand and Segal (2014), there is an issue with using the national account means for adjusting for these top incomes. They explain that Lakner and Milanovic assume that all the differences between their survey and the national account mean are only caused by the underreporting of the rich. This means that the national account means could be easily used for adjusting for the top incomes. However, measurement errors elsewhere in the national accounts may also have influenced the difference between the survey and NA means (Anand & Segal, 2014; Edward and Sumner, 2015). In other words, the criticisms argue that survey and national account means do not only differ due to the underreporting of the rich. This means that using the national account mean cannot be so easily used to adjust for top incomes. On a final note, Piketty and Chancel (2015) also argue that this type of adjusting has led to an overestimation of top incomes.

Chambers and Dhongde (2016) react to Milanovic's methodology by arguing that he makes use of expenditure and income data without making adjustments between the two type of measurements and are used interchangeable. Chamber and Dhongde (2016) argue that this is an issue since mean income levels are higher than consumption levels. In other words, according to these critics, Milanovic makes use of two different type measurements that are not equivalent and this could have led to a downward and/or upward bias when collecting the household data. Furthermore, Krozer (2015) argues that the dataset of Lakner and Milanovic is biased due to the fact that high income groups will have the knowledge and capacity to deduct large sums of their income which could lead to an underrepresentation of their income. Moreover, Jorda and Zarazúa (2016) state that Milanovic looks at average income per income group and this approach subsequently suppresses inequality within each group and does not take into account individual differences per group. Additionally, Rose (2016) argues that Milanovic reports his results on middle income growth in his book without providing any methodological choices on how he exactly calculated the income growth rates. Finally, Hellebrandt & Mauro (2015) argue that Milanovic is looking at within and between country inequalities which are according to these critics not the same and therefore become difficult to compare.

Furthermore, Anand and Segal (2015) and Lahoti et al. (2014) argue that household surveys suffer from certain limitations and biases due to the underreporting of very rich and poor incomes. They highlight that different household surveys are not always comparable due to differences in income definitions and mean income calculations. Milanovic makes use of a dataset composed out of different household surveys in order to obtain a complete coverage on global income data. In addition, Anand and Segal (2015) also state that Milanovic's dataset only represents 99% of the population. In other words, he did not succeed to capture the top 1% of the income distribution which leads to an incomplete dataset of incomes and as a result, he is not able to provide a complete overview of the global income distribution. Milanovic (2016) acknowledges this in his book, but states that in order to solve for the problem of underreporting of the very rich, he looks into wealth and more specifically, at the Forbes's list of billionaires. However, by looking at wealth, a methodological switch takes place: from income and consumption (annual flow variables) to wealth (measured one point in time), which adds up to the accumulation of savings, returns on investment and inheritance (Milanovic, 2016). This is done because there is more data available on wealth for top incomes. In his work, Milanovic (2016: p.39) argues that wealth inequality is greater than income inequality in almost all countries. There is just a small group of people that is considered as enormously wealthy and even in mature economies there is a quarter of the population having zero wealth, while very few people have zero income. This shows that income and wealth are distributed differently. The use of two different type of measurement for composing the income distribution could become problematic since it becomes difficult to compare growth of percentiles when they are not composed of the same type of data. Furthermore, income and wealth levels could have changed over the last twenty years, but are subsequently influenced by different factors that could have led no growth in income while someone's wealth share did growth over time. This repeatedly makes it difficult to compare changes in income and wealth over time. Finally, in his analysis, Milanovic talks about the influence of globalization on income inequality, but he does not mention anything about how wealth is being influenced by globalization.

4.3 Elephant graph

Adam Corlett (2016) argues that the elephant curve is not about the income growth of individuals. He illustrates his argument with an example: people that were in the 40th percentile in 1988 are not necessarily the same people that are in the 40th percentile today. Carolien Freund (2016), a researcher of the *Peterson Institute for International Economics,*

confirms this statement. She states that the graph does not capture how the percentiles changed over time, but only compares a certain percentile between 1988 and 2008. Galasso and America (2014) find that Milanovic and Lakner compare percentiles over time while they aim to focus on individuals. Medeiros et al. (2016) state that Milanovic's approach does not impute data directly about individuals, but looks at accumulated incomes of percentiles. Dijk and van der Linde (2017) also state that the curve does not reflect where deciles per country are located since an income group per country does not necessarily take the same position in the distribution in 2008 in comparison to 1988. They indicate that growth within deciles is not necessarily equal to income growth of individuals with a high or low income and mention that throughout your lifespan people's income will grow up until their retirement (Van Dijk and van der Linde, 2017).

Furthermore, Corlett (2016) comments that population growth especially in poor countries has significantly influenced the composition of the percentiles over the past twenty years. In many percentiles, households in rich countries have been replaced by households in poorer economies. He again provides an example to highlight his point: people that were in the 75th percentile (poor Americans) of the global distribution in 1988, are now pushed to the 80th percentile due to population growth among poorer countries. As a result, the 75th percentile now no longer includes poor Americans but rich Chinese. However, the income of these Chinese is lower than that of the poor Americans which produces a fall in average income in this percentile. As a result, certain groups experienced a fall in income which is not a result of globalization forces, but population shifts that influenced the build-up of income percentiles.

Finally, Freund (2016) states that certain countries are being responsible for the shape of the elephant curve. She excludes China from the analysis and as a result the entire elephant curve disappears. Milanovic acknowledges this in his work and he states that China has been the main driver of the increase in income for developing nations. This highlights that there are regional differences with regards to changes in income over the last two decades. In addition, Corlett (2016) indicates that there is also a large variation between developed economies and their developments in inequality over the last two decades. Especially the United States experienced unequal growth over the last two decades which could subsequently influence the shape of the elephant curve.

4.4 Other events

Freund (2016) argues that several fundamental events other than economic integration influenced a decline in income of developed nations over the last twenty years. She mentions that therefore the interpretation of rich countries not benefiting from globalization is misguided. Freund (2016) mentions two factors, namely the fall of the Soviet Union together with the economic stagnation of Japan driven by its aging population. Both events caused the stagnation in income growth for those countries irrespective of globalization. However, these two countries are still used in Milanovic's global income distribution and this provides a misguided view of how globalization has influenced income levels over the last twenty years.

Furthermore, Corlett (2016) states that globalization is just one way of looking at how incomes have changed over the last twenty years. Milanovic sees globalization as one of the main developments that can explain the changes in income inequality. Corlett (2016) believes that domestic policies such as progressive taxes, social security and fair wage policies are crucial in explaining and determining people's living standards even in a globalized world. In other words, according to Corlett, globalization on its own, cannot explain why differences in living standards exist nowadays and he believes that domestic policies play a big role in this. On a different note, Chanel, Hough and Voituriez (2017) again argue that the effect of technology and globalization on income inequality subsequently depends on government policies and institutions. This means that there is not one way of looking at the effects of globalization on income inequality, but that individual country characteristics like institutions need to be taken into account in explaining the impact of globalization on income inequality.

4.5 Inequality patterns

Scheidel (2017) and Arauco et al. (2014) state that Latin-American countries fail to show an inverted U-curve pattern related to economic development and inequality as is illustrated with the Kuznets waves. This means that not all countries follow the same pattern and therefore the waves cannot be used to explain changes in inequality for all countries. Scheidel (2017) also states that often times emerging industries fail to reach the turning point in inequality levels in relation to the growth of their GDP per capita. This means that when an economy is growing very fast, it does not automatically mean that inequality automatically comes down when the country starts to develop in terms of income which is shown with the Kuznets waves. Jirasavetakul (2016) also argues that there are differences in inequality levels between countries. He states for example, Africa's levels of inequality are contrasting the results of

what is happening at the global level. The increasing share of African inequality is explained by gaps between countries instead of increasing inequality within nations.

Table 1: Overview of reactions by others on Milanovic's work

Author and year	Source	Main critique
1. Data		
Corlett (2016)	Resolution Foundation	Data is not used consistent in the time period of 1988-2008
Linden et al. (2014)	International Panel on Social Progress	Data is limited (covers only 1988-2008)
2. Methodology		
Rose (2016)	Urban Institute	Milanovic reports his results on middle income growth without any methodological choices
Lahoti et al. (2014)	Global Consumption and Income Project	Underreporting of high and low levels of income
Hellebrandt & Mauro (2015)	Peterson Institute	Within country inequalities are not the same as across country inequalities which makes them less comparable
Piketty and Chancel (2015)	Paris School of Economics	Difference between survey income and NA leads to overestimation of top incomes
Chambers & Dhongde (2016)	Journal of Empirical Economics	Make use of expenditure and income levels data without making adjustments since mean income levels are higher than expenditure
Krozer (2015)	WIDER Working Paper	Bias in the dataset of Lakner and Milanovic: highest income groups will have knowledge and capacity to deduct large sums of their income Underreporting of income in developing nations
Jorda and Zarazúa (2016)	WIDER Working Paper	Assumption that all individuals within each income group have the same income, which suppresses inequality within each group, and this leads to downward-biased estimates
Anand and Segal (2014)	International Development Inst.	Make use of NA means for imputing top incomes
Anand and Segal (2015)	International Development Institute	Do not capture the 1% of the income distribution Different households are not always comparable due to different means and calculations

Edward & Sumner (2015)	Doctoral thesis of the University of California	Adjust for top incomes by using NA means

3. Elephant graph

Corlett (2016)	Resolution Foundation	The chart is not about income growth of individuals, but about growth of percentiles
		Influence of population growth on average income percentiles
		High unequal growth in US influenced stagnation incomes
Freund (2016)	Peterson Institute	Chart only compares income percentiles over time
		China being the main driver of the development
Galasso & America (2014)	American Council	Milanovic focuses on individuals in his work of economic inequality while he compares percentiles
Meiros et al. (2016)	Social Indicators Research	This approach does not impute data directly to individuals, but looks at accumulated incomes for quantiles of the income distribution
Van Dijk & vdr Linde (2017)	Economics Statistisch Blad	The curve does not reflect where the deciles per country are located since countries can take a different position in the distribution over time

4. Other factors

Freund (2016)	Peterson Institute	Influence of fall Soviet Union and aging population of Japan on stagnation of incomes
Corlett (2016)	Resolution Foundation	Influence domestic policies
Chanel et al. (2017)	Institute Sustainable Development	Relationship between trade openness, technology and increased inequalities are partly artificial and misleading
		Influence of policies and government decisions

5. Inequality Patterns

Scheidel (2017)	Princeton University Press	Diverges from Milanovic's Kuznets waves since he believes that mainly Latin-American countries fail to show an inverted U-curve pattern
		Emerging industries fail to reach an inflection point in inequality trends in relation to the growth
Arauco et al. (2014)	Overseas Development Institute	Countries do not all follow the same trends in inequality, especially Latin-America

| Jirasavetakul (2016) | World Bank Policy Paper | Africa's levels of inequality are in contrast with the result of the global level, namely that increasing share of African inequality is explained by gaps between countries |

5. Critical analysis of Milanovic's work and exposed critics

The previous section has provided an overview of what others have written in response to Milanovic's work. In this section, I discuss my own view on Milanovic's analysis by zooming into several issues by providing a critical analysis. This critical analysis is performed by verifying statements made by Milanovic and his critiques by using the dataset of Milanovic. The following issues are addressed and critically analyzed: data consistency, regional composition of countries, the elephant curve and the role of globalization. The comments made about the methodology are left out since they were quite technical and I do not have the required knowledge yet to further comment on this. Furthermore, the comments about inequality patterns are also excluded since they are mainly based on individual country patterns and Milanovic mainly talks about the global income distribution and therefore these comments become less applicable to his analysis. As a result, these two factors fall beyond the scope of this research.

5.1 Data consistency

Corlett (2016) argues that the country data is not used consistently in the time period of 1988-2008 and this could have potentially influenced the shape of the global income distribution. After analyzing the Lakner-Milanovic (2013) World Panel Income Distribution (LM-WPID) dataset, it turns out this dataset is not consistent for the period of 1988-2008. This is mainly due to the fact that for several countries data is only available starting in the 1990s. These countries are mainly located in Africa, Eastern-Europe, Latin-America and other parts of Asia. Moreover, there are also differences in the end year. In particular, many African countries only have data available until 2003 and New-Zealand only has data available until 1998. For many mature economies there is a consistent availability of data for all benchmark years while for many African countries there is only income information accessible for one or two respective benchmark years. Finally, for China, India and Indonesia, the dataset includes data for both urban and rural areas. For urban deciles there is again data included both using consumption and income, but it is not specified which one is used in the analysis.

As a result, Lakner and Milanovic (2013) make use of an unbalanced sample which seems to influence the shape of the global income distribution. This is because Milanovic is comparing percentile groups that are not composed of the same samples which in 1988 include different and less countries than in 2008. In Figure 4, Corlett has displayed this argument and reproduced the graph by using a consistent set of countries.
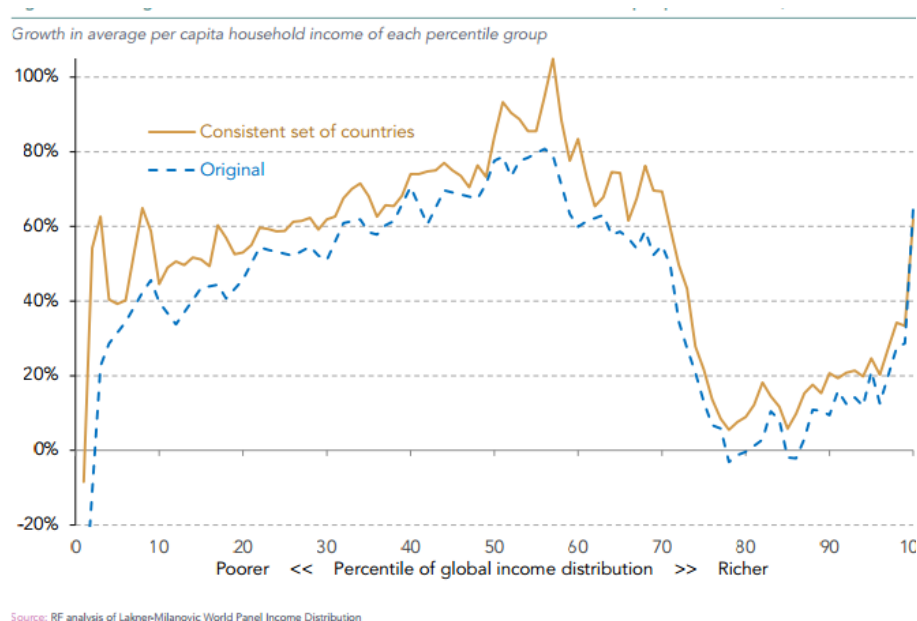
Growth in average per capita household income of each percentile group

Source: RF analysis of Lakner-Milanovic World Panel Income Distribution

Figure 4: Global growth curve with a consistent set of countries and equal percentile sizes, 1988-2008. Source: Corlett (2016)

This graph shows that indeed by including a consistent set of countries the shape of the curve slightly changes: there is higher growth for percentiles until the 60th percentile meaning that especially China experienced higher growth. Furthermore, also the decrease in income growth for rich middle income groups is somewhat lower than in the original model. This indicates that the unbalanced sample seems to have an influence on the shape of the elephant curve and by taking a balanced sample, growth in income slightly changes and overall increases for many of the percentiles.

In his work, Milanovic makes claims about growth in income of certain percentiles. In my view, this analysis shows that the percentiles are difficult to compare since the samples are not composed of the same countries and the 2008 sample includes more and different countries than 1988. Furthermore, it turns out that when using a balanced sample of countries, the shape of the curve changes and income growth becomes slightly higher for all percentiles. Finally, the data can only show whether a percentile has experienced growth or not. It becomes debatable what this really tells us since the percentiles are not composed of the same countries meaning that it becomes difficult to say who actually experienced income growth over the last twenty years. Therefore, in my view, the claims made by Milanovic may be subject to criticism with respect to growth in income of certain country percentiles over time since the claims are not fully supported by its underlying data.

5.2 Regional composition of countries

A commonly made comment made by his critics deals with the fact that the elephant curve only compares the growth rates of certain percentiles over the last twenty years. As a result, the graph does not capture how the global income percentiles may have changed over time and how the percentiles are potentially composed of different countries. In order to observe how the global percentiles are constructed and how they may have changed over time, I have created a regional composition of the global income distribution in the years 1988 and 2008 by using the unbalanced sample of Milanovic. For both years, I have ranked the country/deciles based on their income from low to high and made 10 groups that included 790 observations for the year 1988 (79 per group) and 1240 observations for the year 2008 (124 per group). These groups again represent the global income distribution divided into ten percentiles which is the same procedure Milanovic uses. In the next step, I looked the share of certain regions (region classification derived from Milanovic's dataset) per decile and calculated the percentages that display these shares. For example, the amount of Latin-American country/percentiles that are in the first global percentile is equal to 14.1%. By doing this, you obtain a regional composition (percentages of regions) per global income decile and this provides insight on how the global income percentiles are composed by taking into account the regions. I calculated the shares of regions for the ten global income percentiles and repeated the same procedure for the year 2008. Finally, I took the regional composition per decile, displayed the shares of the ten groups for both years in different colors in Figure 5 and 6 below.

The reason for looking at regions instead of individual country/percentiles is that for 1988 there are 790 observations and for 2008 this number is 1240 and by displaying all of these separate observations into one distribution, the image would be unclear. I believe this regional composition provides information about how the percentiles are constructed and how they might have changed over time.

Figure 5 and 6 below display the regional compositions of the global income distribution in the years 1988 and 2008. By looking and comparing the two distributions the following observations can be made: First of all, as already was indicated by Milanovic, the global income composition has changed. If we look at China, in 1988 this country only reached the 4th decile while in 2008 its income increased up until the 8th decile. This reflects the extremely large increases in income for China over the last twenty years. Furthermore, it could also

confirm Corlett's argument about the composition of percentiles, namely that population growth of emerging economies has led to the downward movement of mature economies. This is reflected by smaller shares of mature economies in the 2008 distribution. However, this change in composition could so be influenced by the growth of emerging economies in regions like other parts of Asia and Latin-America.

Nevertheless, by comparing the two graphs one can state that the composition of percentiles has changed over time. In his work, Milanovic compares percentiles groups and their changes in income over the last twenty years. However, the graphs below indicate that the deciles in 1988 are not composed of the same country deciles as in 2008. This was already pointed in several of the previous critical analyses. This makes it difficult to compare these groups and their changes in income since different income percentiles are composed of different and more countries in 2008. Furthermore, this also shows that Milanovic's dataset only compares the shifts in percentiles while he argues in his work how individuals are affected by globalization. This leads to a misguided view of Milanovic's work on income shifts that occurred over the last twenty years since individual changes in income together with changes in country percentiles are not taken into account. Milanovic states that globalization created winners and losers, but when his dataset only compares groups, it becomes difficult to pinpoint who these people really are. Milanovic's analysis on who has gained and lost from globalization is based on individual changes in income. However, in my view, his data does not support this since it only compares changes in groups while these seem to have changed over the last twenty years.
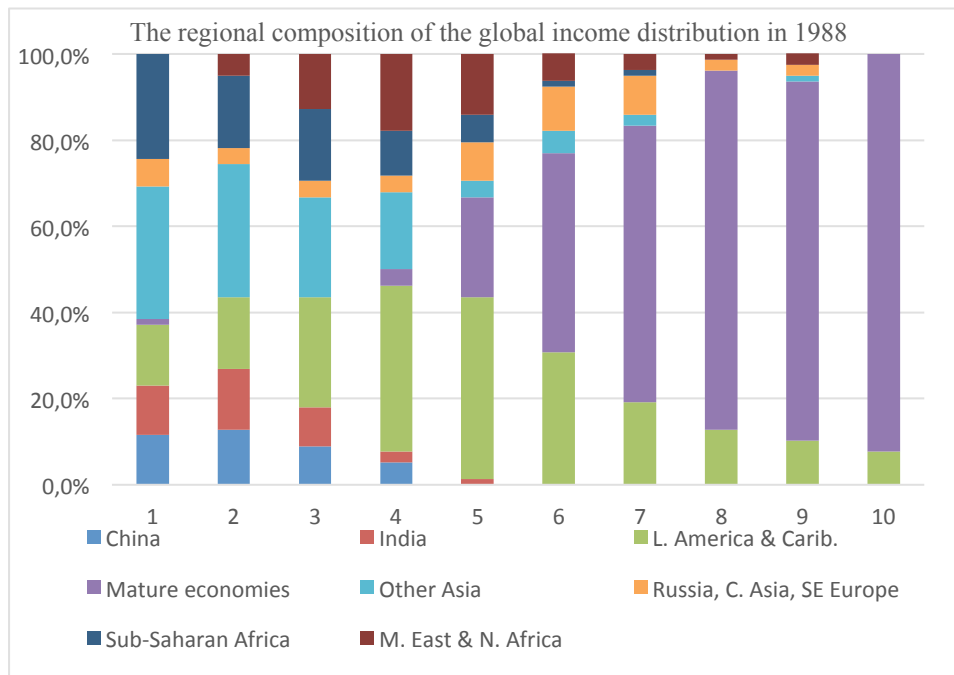
Figure 5: The regional composition of the global income distribution in 1988 in ten country percentiles composed by using the Lakner-Milanovic (2013) World Panel Income Distribution (LM- WPID) data
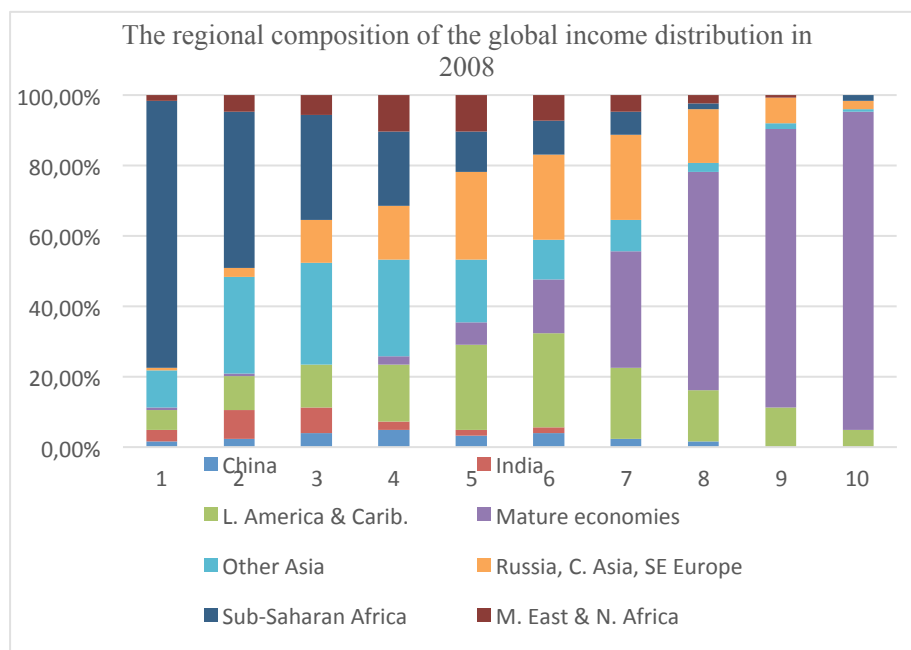

Figure 6: The regional composition of the global income distribution in 2008 in ten country percentiles composed by using the Lakner-Milanovic (2013) World Panel Income Distribution (LM-WPID) data

In a recent published blogpost, Lakner and Milanovic (2016) have provided a reaction to the comments made by Adam Corlett mentioned in the beginning of this section. In response, Lakner and Milanovic keep the 1988 country/deciles fixed at their initial positions and look at the growth in income of these deciles. This according to Lakner and Milanovic (2016) solves two issues: it controls for the movement of deciles up or down the distribution and it controls now for changes in population growth. However, in my opinion, keeping the 1988 percentiles fixed still leads to the critical remarks: First, the data comes from national surveys and are based on random samples which potentially could include different people every year. In addition, keeping deciles fixed still does not say anything about growth in income of individuals. Finally, over time it could still have been the case that people within these deciles have moved up or down the income distribution, which is not taken into account when you keep country/deciles fixed at their 1988 positions. Therefore, I believe that keeping countries fixed is a useful way to look at the growth rates of country/deciles over time, but the aforementioned issues with Milanovic's analysis persist since it still does not tell us something about individual changes in income that potentially could have influenced the composition of the global distribution over time.

5.3 Elephant graph

Both Corlett and Freund (2016) argue that several countries like Japan, China and the United States have had a significant influence on the shape of the elephant curve. In order to verify this, it became necessary to reproduce the elephant graph which represents the growth rate of global income percentiles over the two decades, and subsequently investigate whether these statements can be verified by excluding these certain countries out of the equation.

Figure 7: Replication of the Lakner-Milanovic elephant curve 1988-2008

Figure 7 displays the replication of the elephant curve by making use of the dataset of Lakner and Milanovic (2013). In a recent blog post, they have provided a code that can be used in Stata to reproduce the graph. Lakner and Milanovic make use of an unbalanced sample of countries and I used the same sample for the reproduction. It shows the same pattern as the original curve, namely that the percentiles starting from the 30th percentile to the 55th have experienced high growth in income together with the top percentile of the global distribution. The 70th and 80th percentiles have experienced a decline in income growth which represents the stagnation of the middle income class of rich countries. However, this replication shows a slight difference with the original elephant curve, namely that the shape for the lowest percentile groups shows a steeper upward line, suggesting a more pronounced difference in incomes at the bottom of the global income distribution.

In the figures below, I have excluded several countries from the dataset with the aim to see if the shape of the curve would change and therefore investigate if there are certain countries driving the shape of the elephant curve. Firstly, Figure 8 excludes the Japan out of the global

income distribution. According to Corlett (2016), Japan has experienced a decline in income growth driven by its aging population and therefore another factor than globalization has played a significant role on its stagnation of growth in income. As one can observe, by excluding Japan out of the equation, the decline in growth of income for the 70th and 80th percentile becomes less steep and stays above the zero line. Furthermore, the increase for the top percentages also becomes less steep. This means that Japan's ageing population has had an influence on the decline of income for the 70th and 80th percentile together with the high increases for the top percentiles.

Figure 8: Replication of Lakner-Milanovic growth elephant curve (excluding Japan)

The next figure presents the curve without including China. According to both Freund and Corlett (2016), China has been the main driver of this distribution and explains why the 30th up until the 55th percentile have experienced the increases in income growth. Figure 9 shows that the high increase in income growth around the 55th percentile almost completely disappears when comparing it to the original curve. Moreover, the growth rates around the 30th until the 55th percentile are significantly lower. This seems to confirm that China indeed has been the main driver of the high increases in income growth of the new global middle

class. Furthermore, another interesting observation that arises from this graph is that the growth rates for the rich middle income class around the 60th and 80th percentiles are significantly lower and even go below the zero line when China is excluded. This actually seems to confirm Milanovic's argument about China being the real winner of globalization while the rich middle income class can be considered as the loser. The top percentile also has experienced lower growth in this figure than in the initial version. In general, this graph shows that when you exclude China out of the equation, the growth rates become lower for all percentiles and this demonstrates the overall significance influence of China on the global income distribution.
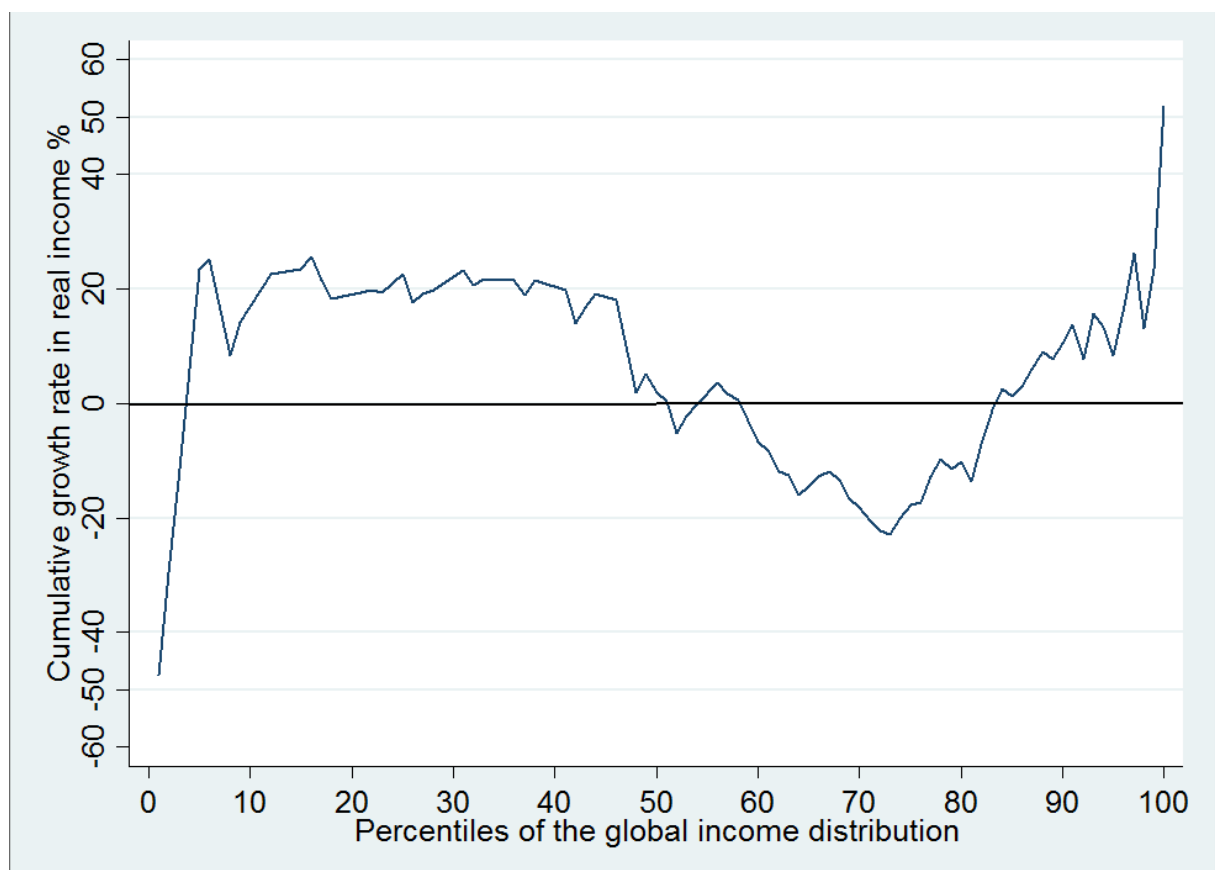

Figure 9: Replication of the Lakner-Milanovic growth elephant curve (excluding China)

Figure 10 depicts the curve without the United States. Corlett (2016) mentions in his analysis that the United States has experienced very unequal income growth over the last two decades and it would be interesting to see what would happen to the global income distribution if one eliminates the US. The curve remains for a substantial part the same as the original version, but an interesting differences arises when looking at the top three percentiles. As it turns out,

the decrease for the 70th and 80th percentile becomes less steep and the increase for the top percent significantly decreases. This suggests that the US is driving a lot of the observed patterns caused by high within nation inequality between the middle income class and the top one percent. Subsequently, this figure could potentially help explain why Trump received so much support during the last American election, namely the middle class being unsettled with the unequal allocation of income growth between the middle class and the top percent of the American income distribution over the last twenty years.
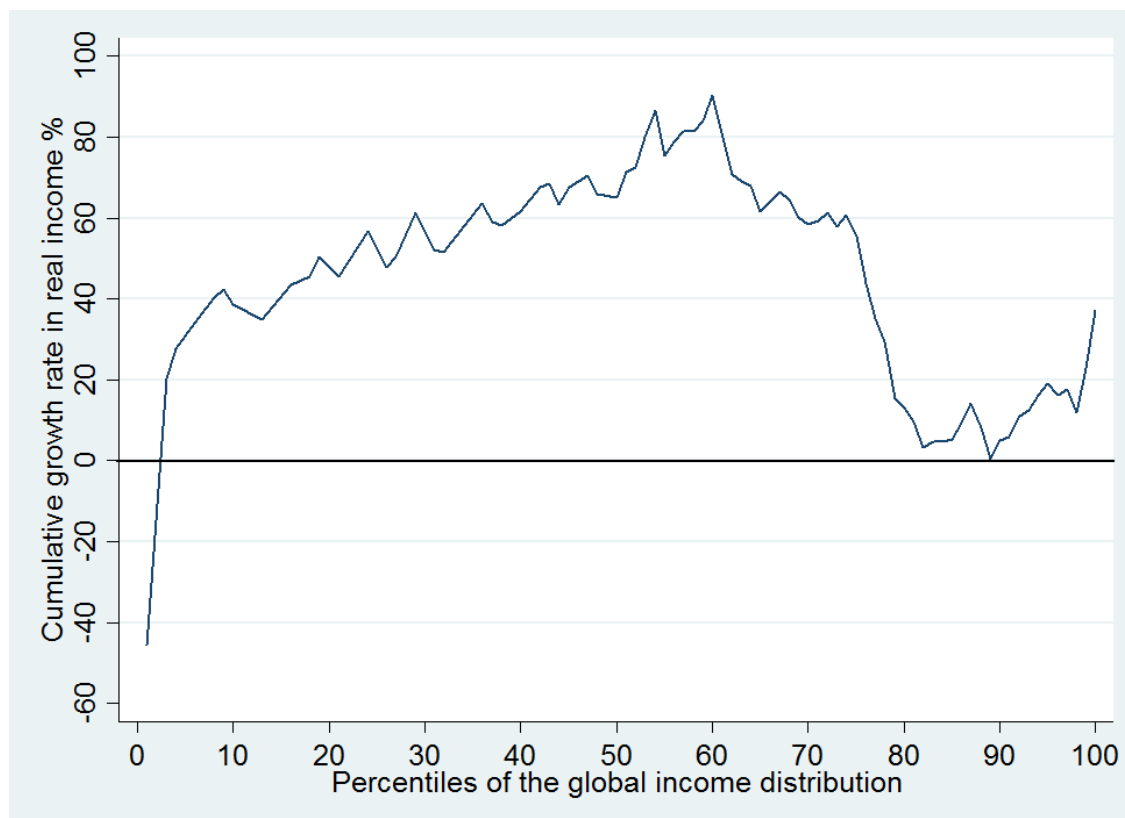

Figure 10: Replication of the Lakner-Milanovic global elephant curve (excluding US)

Finally, Figure 11 displays the growth of the global income distribution without Japan, US and China. This is done to illustrate the impact of these countries all together on the shape of the elephant curve. It shows that again the shape of the curve changes and almost disappears when excluding these three countries. The growth rates for the global middle class become lower and also the decrease for the middle income class in rich countries becomes less steep.
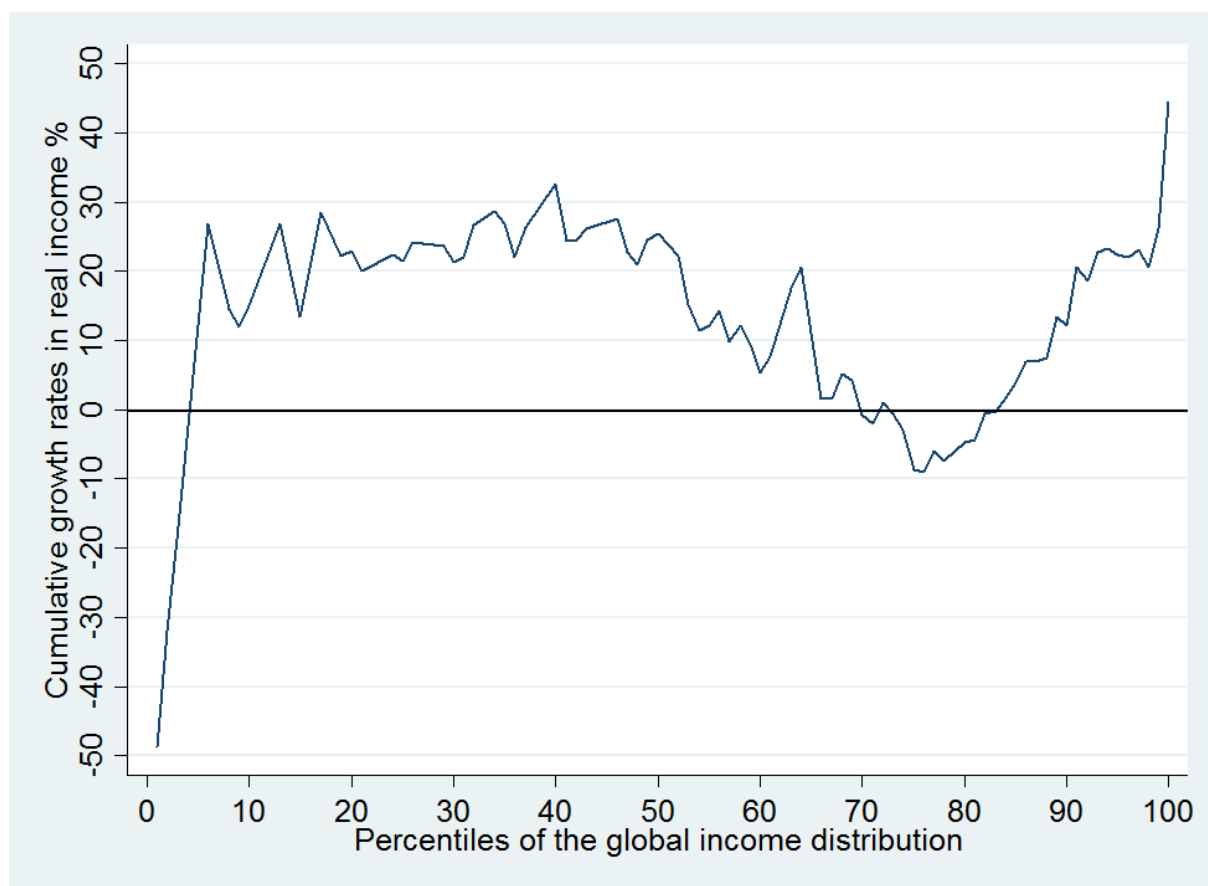
Figure 11: Replication of the Lakner-Milanovic global elephant curve (excluding US, Japan and China)

This illustrates that as a result of excluding certain countries out of the equation, the shape of the elephant curve changes and/or even disappears. In other words, this shows that the exclusion of Japan, China and the United States confirms the exposed critiques of Corlett and Freund that indeed these countries influence the growth rates of the global income distribution. Lakner and Milanovic (2016) here also provided a response to the comments made by Corlett. They argue that is empirically indisputable that over the past twenty years, even when excluding China, Asian countries have had a high rate of income growth. Moreover, it is beyond dispute that the middle class in rich countries experience relatively low rates of income growth. Lakner and Milanovic (2016) state that there is nothing wrong with dropping countries out of the elephant curve and did the same in order to highlight the importance of China. However, they indicate that it is rather obvious that when you exclude certain countries, the shape of the curve changes since it depends on having the whole world being included, and highlight the fact that it is about a global income distribution. Moreover, they state that it becomes difficult to compare graphs that exclude countries out of the

equation because this influences the ranking of countries and the creation of percentiles on the horizontal axis.

In my view, by taking into account the reaction of Lakner and Milanovic and examining the different graphs above, it appears that the middle income class of Asian countries has experienced growth in income while the middle class of rich nations did not. However, the graphs do show that when excluding certain countries, especially China and the US, the shape of the income growth rates change. Furthermore, the argument of Lakner and Milanovic that the elephant curve is based on a global income distribution and subsequently changes when excluding certain countries also seems accurate. It also provides insights about which countries actually can be considered as the winners and losers of globalization. However, this should not be used as an argument against excluding countries since doing so still provides insights on which countries are influencing the shape. As it turns out, this analysis shows that undeniably there are certain countries responsible for the shape of the elephant curve. Milanovic makes in his work claims about changes in global inequality, but in my opinion, it becomes debatable whether the developments in income inequality can be really applied to the global level. In order to research this, it becomes necessary to look at inequality levels within countries and how income growth is distributed within countries. This will provide insights on whether the developments in income inequality Milanovic describes can be applied to a global level.

5.4 The role of globalization

In his work, Milanovic argues that globalization is one of the main drivers that help explain the shape of the elephant curve. The first issue here deals with the fact that this curve starts in 1988 and one may wonder why this point in time is presented as the beginning of globalization while worldwide integration already occurred before. Milanovic talks about the second wave of globalization, but according to Baldwin and Martin (1999) this already started in the 1960s. Therefore, the globalization period Milanovic discusses does not cover the complete globalization period. This could have had an influence on the shape of the elephant curve since it only compares the growth rates of country percentiles of the last twenty years. By including a longer time period, which covers the full globalization period, the growth rates might change, but then at least these growth rates say something about the full globalization period.

Moreover, globalization is supposed to take a central position in explaining the developments in global inequality. However, in my opinion, the precise impact of globalization on global inequality is not always very clear. In the beginning of his book, Milanovic only states that the globalization period he describes coincides with major events like the fall of the Berlin Wall and the integration of China into the world economy that subsequently led to the availability of cheap labor. The more in-depth explanation of how globalization influences income inequality only appears after one hundred pages of reading and turns out to be intertwined with technological advances and economic policies. Furthermore, as mentioned by Freund (2016), other events, such as the aging population in Japan also had a significant influence on the growth rates. As a result, these observations illustrate that it becomes difficult to pinpoint the individual effect of globalization while it seems like an important factor for Milanovic in explaining the developments in global income inequalities over the past twenty years. A possible explanation for why it becomes hard to identify the effect of globalization could be that Milanovic mainly makes use of descriptive data in his analysis. In his work, he provides interesting data on global income growth. However, when explaining what has triggered these changes, Milanovic nearly only describes what has happened over the last two decades and attributes it to factors like globalization, technological advances and economic policies. As a result, he does not provide quantitative evidence throughout his analysis on how globalization could have potentially influenced global income inequality. Respectively, this makes it difficult to identify the precise role of globalization and measure its individual effect. In my view, this is a weakness in his analysis since it provides a limited explanation on how globalization has influenced income inequality.

In the blogpost, Lakner and Milanovic (2016), state that they have never argued that the low growth rates of Western middle class are due to globalization alone. In fact, they even mention that the issue of globalization is not even discussed in their paper and that in Milanovic's book *Global Inequality* globalization always has been discussed in conjunction with other factors. However, interestingly enough, Lakner and Milanovic (2013) begin their conclusion with the following sentence "this paper has provided evidence on the evolution of the global income distribution during a crucial period of accelerated globalization". Furthermore, they state "it is very important to study what its effects (globalization) are on the level and distribution of income among the world population" (Lakner and Milanovic, 2013). In addition, for the book of Milanovic, he starts his introduction with the winners and losers of globalization, and subsequently illustrates this by referring to the elephant curve. Only later

in the book, globalization is considered as being intertwined with technological advances and policies. This demonstrates that Lakner and Milanovic, and subsequently Milanovic himself take into account globalization and consider it as an important factor explaining changes in global inequality. However, as aforementioned, there is no empirical data provided on how exactly globalization influences the global income distribution and these changes are only attributed to the time period in where all of these developments took place.

6. Summary and Conclusion

To summarize, the aim of this research was to investigate whether Branko Milanovic's analysis about globalization and income inequality can provide an important contribution to answering the general question stated in the introduction: does globalization lead to increased income inequality?

Milanovic in collaboration with Lakner make an important contribution to the discussion of inequality since they are the first ones that composed a global income dataset that allows one to look into the global income distribution, and subsequently, how this distribution has changed over the last twenty years. Furthermore, Milanovic provides a new and interesting explanation on the development in global income inequality. He explains that over the last two decades, globalization has led to the decrease in inequalities between nations while within nation inequality has increased in this period of time. As a result, he has contributed in providing an explanation for the current events of the Brexit and the election of president Trump. He highlights that emerging countries in Asia are the real winners of globalization while the rich middle class are considered the losers. Milanovic managed to display this development into one graph: the elephant curve which provides a simple, but comprehensive explanation on what happened over the last two decades. As a result, Milanovic made the current trends in inequality accessible and understandable for the public and contributed in starting the discussion about changes in inequality. Finally, with his work Milanovic makes a valuable statement: global inequality has started to decrease which has been driven by the increase in income for the emerging economies and is displayed with a slight decline in the global Gini index.

However, in order to further investigate Milanovic's contribution, this paper looked at reactions of others that were made in response to Milanovic's work. From all these reactions, four issues: data consistency, regional composition, elephant curve and the role of globalization, were critically analyzed. As a result, four critical remarks can be made towards the work of Milanovic. First of all, the dataset Milanovic uses for the years 1988 and 2008 is not used consistent which makes it difficult to compare income growth of percentiles. Secondly, by looking at the regional composition of the global income distribution, it appears that this composition has changed over the last two decades. As a result, Milanovic analysis only displays the growth in income of certain percentiles without taking into account the possibility that these percentiles have changed over time. Therefore, it becomes debatable what these growth rates really tell us since these changes in composition are not taken into

account. Furthermore, Milanovic makes in his work claims about individuals and their respective growth in income, but his data does not support this since he only compares percentiles over time. Third, the reproduction of the elephant curve and the exclusion of Japan, US and China shows that there are certain countries responsible driving the shape of the curve. Milanovic makes in his work claims about global inequality, but it is up for the discussion whether the developments in global inequality he describes can be applied to the global level. Fourth, globalization takes a central position in Milanovic's analysis in explaining the current developments in global inequality. He provides insights on how globalization has influenced these developments: globalization led to the use of cheap labor in Asia which subsequently led to reduced prices of producing capital goods. As a result, companies decided to offshore their production of capital goods to developing nations due to the availability of cheap labor in Asia. This subsequently led to the disappearance of low-skilled jobs in developed nations. In contrast, globalization led to job creation in developing nations that also contributed to growth in income. However, the individual effect of globalization is difficult to pinpoint and it appears to be intertwined with technological advances and economic policies. A possible explanation for this could be the fact that Milanovic only makes use of descriptive data without providing empirical claims on how globalization might have influenced global income inequality.

To conclude, this research shows that Milanovic provides an important contribution to the discussion of global income inequality and explaining the developments in inequality that have occurred over the last two decades. Furthermore, he also provides a possible description on how globalization has influenced global inequality. However, as this paper shows, Milanovic's explanation on how exactly globalization has affected the developments in global inequality is up for discussion since he does not provide empirical data to support his claims. He has the data, but can only explain the developments in global income inequality by referring to the high globalization of period in 1988-2008. Moreover, the individual effect of globalization remains intertwined with technological advances and economic policies. Therefore, Milanovic's contribution to the discussion of globalization influencing income inequality has its limits since the analysis he makes about globalization and global inequality is not fully supported by the data he uses.

As a result, this paper shows that it is important to have a critical attitude about research. Milanovic's analysis and the elephant curve seem to provide an attractive explanation of what has happened over the last two decades with respect to globalization and income inequality.

However, as this paper shows, his analysis is not always fully supported by its data and therefore, invites people to have a critical attitude and dive into research to investigate whether the analysis of researchers made is truly supported by data.

Nevertheless, this paper also has certain limitations which include leaving out the methodology and inequality pattern critiques. In future research, a broader range of factors could be taken into account in order to provide a more comprehensive critical analysis. For the methodology aspect, a more profound understanding of adjusting for top incomes is necessary. Furthermore, this research provides a critical analysis of Milanovic's theory, but the paper does not use an original dataset and does not provide an alternative approach on how globalization could have potentially influenced global income inequality. Therefore, in the future, research could focus on providing an empirical analysis of the effect of globalization on income inequality. This could be done by looking into factors that represent globalization or openness, as for example, exports or foreign direct investment. A model could be created that takes these factor into account and investigates whether there is a relationship, by looking at correlations, between globalization and income inequality. This will also allow one to control for the influence of technological advances and economic policies and also investigate their influence on income inequality. Finally, future research should focus on improving and expanding the valuable global dataset of Milanovic and Lakner with the aim to require a complete dataset on global income that will allow us to make more profound claims about the global income distribution.

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