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Inequality in times of Covid

1. Introduction

Currently, the Covid-19 crisis plays a central role in economics. It appears that the crisis will bring along some changes which do not simply disappear as soon as all citizens have received a jab. So when thinking about issues in our societies like inequality, considering the Covid-19 crisis becomes inevitable. The Covid-19 crisis has shown the scope of possibilities to implement new measures and tools, this also holds for measures against inequality. For example, unconditional money transfers to households, more flexible unemployment schemes, emergency loans, and worker allowances for industries hit hard by the pandemic. The pandemic also triggered mechanisms such as the Covid-Bonds and workers' benefits which before would not have been considered feasible before. Observing these fast-paced movements, one becomes aware of the enormous possibilities which have suddenly have been enabled are apparent. The sudden shock brought about by the new Coronavirus highlights different sides of societies and points out the weaknesses of each system.

The rise of inequality in the developed countries is one of the principal challenges nations are confronting today. Regarding economic inequality, there have been different periods of evolution. The most recent developments show a divergence of global inequality, meaning that the level of inequality between developed and developing countries is decreasing. This trend is mainly driven by the rise of the middle class in the BRIC countries. However, it displays only the development of global inequality, inequality between countries. When looking at inequality within countries, especially in developed countries, the trend goes in a different direction. In most European and Anglo-Saxon countries, within-country inequality has risen in the past 40 years. Several factors may explain these developments, yet, the question remains why levels of inequality are different in different countries, which have developed similarly and have similar trading positions. Research shows that the European countries are generally more equal than the Anglo-Saxon countries. This difference can be explained by two factors. First, the social welfare systems in the European system and the orientation to the markets. Income inequality in Anglo-Saxon countries is more market-based than in European countries. Generally in Anglo-Saxon and European countries income inequality is mostly driven by top incomes, which rose stronger in the United States than in Europe. The analysis of the development of the bottom 50% share and the top 10% share according to three groups, Anglo-Saxon countries, Mediterranean countries, and Nothern / Central European countries has shown despite Regardless of these trends, the outbreak of the Covid-19 pandemic has shaken up the world. Moreover, early research has shown, that the Covid-19 exacerbates existing inequalities. Undoubtedly the crisis of Covid-19 has triggered numerous more discussions about inequality, such as inequality due to gender, race, or economic status. Christine Lagarde states in an interview with the Aspern Institute: "No question that the impact of the pandemic has exacerbated inequalities of income and possibly inequalities of opportunities as well." (28.04.2021). The exogenous shock imposed by the Covid-19 pandemic lead to a simultaneous decrease in supply, demand, and productivity channels. Early research shows that the Covid-19 crisis reveals and reinforces ongoing issues in inequality. However, the pandemic also brings more attention to ongoing problems and exposes weaknesses in existing systems. The complication behind the shock is not only the drop in GDP, which leads to short-term financial shortages but also the unequal

dimensions through which Covid-19 affects individuals. For instance, certain sectors (such as tourism, the event industry, artists, and gastronomy) have been more greatly impacted by the shock of Covid-19 than others. Additionally, sub-groups dependent on gender or ethnic origin have been affected differently by the pandemic. This unequal impact of the pandemic raises the question of how the Covid-19 shock affects inequality. Does the shock only reinforce existing trends? Or does it bring along new trends?

Regardless of the pre-existing inequality trends, there have been several measures to remedy the negative effects of the Covid-19 shock. These measures include subsidiaries to workers' income and businesses, tax reductions, and investments into the health system. The large scope of fiscal measures introduced helped to mitigate and remedy the negative effects of the Covid-19 shock. Early research and estimates show that in several European countries inequality decreased in the initial period of the pandemic, thanks to the generic fiscal measures. However, this is only an early picture, and the long-term effects remain unknown. In this thesis, I want to investigate the dimension in which the Covid-19 policies lessen inequality, and how the aforementioned policies affect long-run disparities in inequality. Given the state of emergency during the pandemic, some policies are provisional to address the emergency and are not designed to mitigate social disparities in the long run. Moreover, given the rush of decision-making, some of these provisional policies might benefit certain groups more than others. So the question arises whether governments might have provided more support in certain areas and not enough in other areas, which would lead to an unequal recovery of the economy. These inequalities could be motivated by political pressure from powerful groups. Given these complications regarding the Covid-19 policies, I will further discuss the question of whether the Covid-19 shock caused a change in inequality or if it just reinforced the existing trends. In my thesis I will discuss the following hypothesis: The Covid-19 crisis exposes and reinforces the ongoing issues in inequality but helps to overcome them by recreating policies. Therefore, I will investigate the effects of the existing policies. The pandemic suggests that the shock must increase inequality, as the poorer people are first of all harder hit. And in a second dimension, they are less resilient, as they have fewer resources to cope with the consequences of the shock. To properly assess the implications of the Covid-19 crisis on inequality I will start to describe the general situation regarding inequality before the Covid-19 crisis. To develop a comprehensive understanding, I want to discuss the types of measurement of inequality and the data sources available to analyse inequality. Then I will provide an overview of global economic inequality. Setting the scope of this thesis on Anglo-Saxon and European countries, I will further exemplify recent trends in 15 countries over the past 40 years. I will subclassify these countries into three groups: Anglo-Saxon countries, Mediterranean countries, and Northern / Central European countries. After analysing the trends from a quantitative side, I will discuss the trends from a qualitative point of view. Accordingly, I will examine the driving forces of inequality, which will be discussed according to technological change, changes in the economic structure, the skill-biased labour markets, and other explanatory factors. I also want to explore existing policies designed to tackle inequality. After having gained a foundation to discuss inequality, I will describe and discuss the Covid-19 shock. Herefore I will provide a general overview and then further discuss the policy responses to Covid-

19. As I want to investigate the effect of the policies on inequality, I will start with a literature review on the recent findings of the impact of the Covid-19 crisis on inequality. Then I will conduct my analysis. This will consist of a comparison of fiscal policies and the drop in GDP, due to the crisis. Then I will analyse the evolution of GDP per capita and disposable income. Finally, I will conduct a regression of the effects of government policies on inequality.

2. Inequality in the world before Covid-19

As of 2020 trends in inequality were not universal. While income inequality has increased in most developed countries and in some middle-income countries, (including China and India) since 1990, income inequality has declined in most countries of Latin America and the Caribbean and in several African and Asian countries over the last two decades. Yet, as the World Inequality Database summarises: Two thirds of the world's population live in countries where inequality has grown. Data from the World Inequality Database has shown that the richest 1 percent of the global population increased in 46 of 57 countries and areas from 1990 to 2015 (United Nations, 2020).

In this chapter I will give a brief discussion in the measurement of inequailty. Then I will provide an overview of trends in inequality before the Covid-19 crisis, as a basis to later evaluate the effects of the Covid-19 crisis on Inequality. Accordingly, I will first outline the development of global inequality. Within the framework of my thesis, I want to set the focus on advanced countries, as the Covid-19 crisis is particularly prominent in these countries, data and research are more available, and many differences among countries raise questions about the effects of the crisis. To be more specific, I will discuss the trends of inequality in 15 European and Anglo-Saxon countries. For my analysis, I will subcategorize these countries into three groups. These groups are Anglo-Saxon countries, Mediterranean countries, and Northern / Central European countries. The selection of the group is motivated by the following factors regarding their policymaking: market orientation of the states, the degree of welfare systems, and economic conditions. The Anglo-Saxon countries for instance are rather market-oriented and have a less inclusive welfare system. Meanwhile, European countries, in general, have a stronger developed welfare system. Regarding the European countries, the Nothern / Central European countries are again considered to be more egalitarian and/or are economically more stable than the Mediterranean countries. The Mediterranean countries show throughout the past years more weaknesses in their social systems and economically, especially since the financial crisis of 2007, which affected in particular young citizens.

2.1 Measurement of inequality

Economic Inequality can be measured in different ways and by using different types of data. Different indicators are used to assess inequality. These include shares of the income distribution, ratios, and indices. These indicators are based on different types of data, the most common types of data are household surveys,

tax data and data on income. There are certain advantages or disadvantages regarding these types of data and one needs to be careful in making use of and interpreting the results based on the data as it is said to be highly imperfect. In the following, I will discuss several indicators to measure inequality and the available data sources.

2.1.1 Tools to measure inequality

There are several ways of measuring inequality. The most common ones are shares of distribution, ratios, and indices such as Gini Coefficient and the Theil Index. All of them hold certain qualities in assessing and analysing inequality. Looking at the shares of income distribution one can simply take a share of the income distribution, like the top 10 percent, the top decile, and determine how many shares of the income the given part of the population holds. To interpret these percentages it is useful to think about perfect social equality. In this case, the top decile, if there was perfect equality, would have exactly its percentage of income, meaning exactly 10 percent of the total populations income. In contrast to that, in the case of perfect inequality, the top decile, for example, would have 100 percent of the income (Piketty, 2020). Other common shares of the income distribution are the top one percent, the bottom 40, and the middle 50 percent. The main advantages of expressing inequality in shares are that they are easy to interpret and offer insights into the distribution of income within a society, particularly because the possibility to look at specific social groups within a society reveals more information about the disparities between the different stratas and makes the identification of these disparities more accurate.

It may be useful to examine inequality amongst countries to continue the investigation. Therefore, one can use a ratio between the shares of the income distribution, such as the top 10% versus the bottom 50%. The ratio between shares reveals significant differences between countries, is easy to understand, and can be directly related to fiscal and social policy (Piketty, 2020).

In the category of the indices, the Gini Coefficient is the most common index. The Gini Coefficient measures income disparities. It is expressed as a number between zero and one, where zero represents total equality and one represents total inequality, meaning that one person holds all wealth of a society and the rest no wealth. The Gini Coefficient is derived from the Lorenz Curve. The Gini Coefficient then represents the region between the Lorenz curve and the line of complete equality (Atkinson, 1970). Piketty (2020) discusses the downsides of the coefficient which are that it does not reveal differences and changes over time between different social groups within the society. He further criticises that the Gini Coefficient is generally calculated on based on data that inherently tends to underestimate the degree of inequality, such as household surveys. Despite these downsides, the index makes it easy to compare income disparities across countries and is still used broadly when looking at inequality.

Another common index is the Theil index. The Theil index is expressed in a number, which starts at zero and goes towards infinity. In contrast to the Gini Coefficient, the Theil index can be broken down into its components and does not rely on the Lorenz curve but on a T statistic. The approach has its origins in information theory and was describes by Theil as follows: “The Theil Index can be interpreted as the expected

information content of the indirect message which transforms the population shares as prior probabilities into the income shares as posterior probabilities" (Theil, 1967, pp. 125-126). The index is calculated from tabulated income share data or determined from a density function of income distribution. Herefore, the income of a certain group is ranked and under two assumptions it becomes formally identical to ranking probability distributions. One assumption is that the underlying social welfare function is twice differentiable. And if the second assumption, the assumption that the underlying distribution is preferred over another distribution holds, then it will rank the same as any concave social welfare function. Theil's approach helps to quantify the level of disorder within a distribution of income. Income inequality is measured by the discrepancy between the structure of the distribution of income. The Theil index, thus, is a number that reflects the extent of the measured discrepancies, the inequality. In the case of equality, saying all groups have their "fair share" of income, the value of the Theil Index would attain its minimum value, which is zero. Accordingly, with an increasing value of the Theil index, the measured inequality increases. A great advantage the Theil Index offers is that it can be decomposed into arbitrarily defined subgroups. By exploring its additive decomposability characteristic, the index can be used to measure regional disparities (Conceição & Ferreira, 2000).

Another method to assess the data on inequality is called the "Equalivalised Disposable Income". With this method, the household income is made equivalent to that of a single adult. This is done by arbitrarily allocating to each individual in the population the income of the household where he/she lives, including taxes and cash transfers which are then divided by the weighted number of people living in the household (Bourguignon, 2017). In the next step to assess the development over time or to set different countries in relation, the "Equivalized Disposable Income" can be transferred into an index, like the Gini Coefficient, or into a time-series of the Gini Coefficient.

2.1.2 Kinds of data to measure inequality

The previously discussed methods of measurement for income inequality can be based on different kinds of data. Generally, country time-series originate from household surveys, tax data, national accounts, heritage records, or other data on income. The quality of the data which is used is very important and collecting good results is more difficult than one would assume in the our modern digital world. Piketty (2020, p. 670) states that: "it is paradoxical that in the so-called age of big data, public data on inequality are so woefully inadequate". To adress this issue, there are several public online data sources, for example, the World Inequality Database (WID.world). The World Inequality Database tackles the issue of insufficient quality of data by providing open and convenient access to an extensive database on the historical evolution of the world distribution of income and wealth. From 1980 onwards the World Inequality Database provides income distribution series for all nations of the world on an annual basis. On the database there is relatively good coverage of income distribution in most world regions regarding the period from 1910 to 2020 (World, 2021). Apart from the availability of data there are still limitations and imperfections. Next to national accounts, one can make use of household surveys. The main problem with household surveys is that high-

income households tend to underestimate their income. Thus analysis based on self-declared household surveys understates inequality to a significant degree. Another problem is that the top 1 percent population in the income distribution is most likely not well represented in household surveys, so surveying procedures tend to undersample the very wealthy or super-rich and/or under-estimate their income (Bourguignon, 2017). Nevertheless, it is a crucial part in analysing inequality, since inequality stems from the top 1 percent owning considerably more than the rest of the population. It is plausible to assume that inequality measures based on household surveys understate inequality.

The usage of fiscal data is described by Chancel and Piketty (2021) to generally improve the quality of measurement substantially by correcting the data at the top of the distribution. Yet, it is said to be highly imperfect and may reveal poor enforcement of tax laws and inefficiency in their applications. In his review, Ravallion (2018) discusses the limitations in data as well. He states that these limitations lead to uncertainties and ambiguities in the economic analysis of inequality. But by describing Bourguignon's approach, he shows a possible way to provide a comprehensive accounting of the forces influencing inequality despite the uncertainties and ambiguities. He describes Burguignons approach to be grounded in neoclassical economics, and that by including real-world features such as market failures and poverty traps he manages to get a broader analysis despite the limitations in data.

Chancel and Piketty (2021, p. 2) state that "The only way to obtain a comprehensive view of inequality is to compare different sources". Piketty (2020) states, that the different sources shed complementary light on different segments. Generally, he states that the quality of public data is decreasing, due to special rules applied on financial income, even though modern information technology should have the opposite effect. He argues that the new technology makes it possible to automate monitoring procedures and to tabulate detailed information about financial income and the assets from which it derives.

2.1.3 Levels of Economic Inequality

Economic inequality can be subcategorised into several levels: global inequality, inequality among countries, inequality within countries, inequality among social groups, and finally inequality within a social group. I will start with global economic inequality, to establish a better general understanding of the current situation of inequality in the world. To continue I will discuss economic inequality among countries. That will create a basis for the following parts and analysis of this thesis, as I would like to set the focus on economic inequality in the European Union and Anglo-Saxon countries.

On a next level one could further investigate inequality regaring subgroups within a country. These subgroups could be anlaysed in respect to gender inequality, ethnicity and race, religion, social class, education and many other factors. However, I will not discuss this type of inequality further as it will be out of the limits of this thesis.

2.2 Global Inequality

Global economic inequality encompasses the general trend of inequality. It can be defined as follows: "The relative inequality of incomes among all peoples of the world ignoring where they live" (Ravallion, 2018). Considering the level of global income inequality, Chancel and Piketty (2021) conclude that it has always been very large, which reflects the persistence of a highly hierarchical world economy. They conclude this based on newly available historical series of country-level population on world income distribution estimates from 1820 to 2020 and after analysing the development of the share of total world income in percentage (the top 10 percent, middle 40 percent and bottom 50 percent (see also Figure 1)). In figure 1 one can see that the gap between the top 10% and the bottom 50 % has always been large. Moreover, the figure indicates an increase in inequality. More precisely, the figure shows that the global top 10% income share has oscillated around 50 – 60 % of total income in the last 200 years, while the bottom 50 % share has remained around 5 – 10 %. Also, the middle 40 % remained on average between 35 – 40 %.

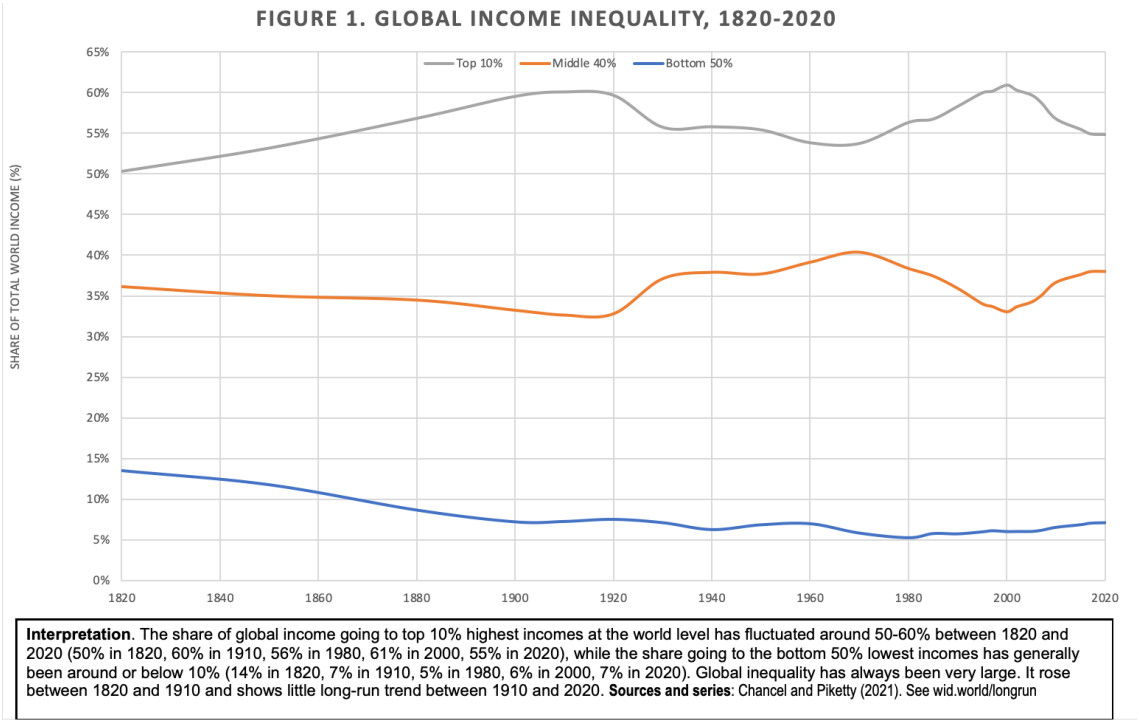


Figure 1 – Global Income Inequality, 1820-2020 (Chancel and Piketty, 2021)

When analysing the Gini Coefficient Chancel and Piketty (2021) find that the global Gini index increased from 0,6 in 1820 to 0,72 in 1910. In 2000 it reached again 0,72 and dropped slightly to 0,67 in 2020. They note that the peak was reached in 2000 and since then entered a descending trend. They further look at the T10/B50 ratio, the ratio between the average incomes in the top 10 % and the bottom 50 %, and find that, unlike the Gini Coeffient, the peak in inequality according to this ratio was 1980. Generally, based on these two measurements, they conclude that global inequality increased between 1820 and 1910 and then stabilized at a very high level between 1910 and 2020. They attribute the increase in equality up to 1910 to the rise of Western dominance and colonial empires.

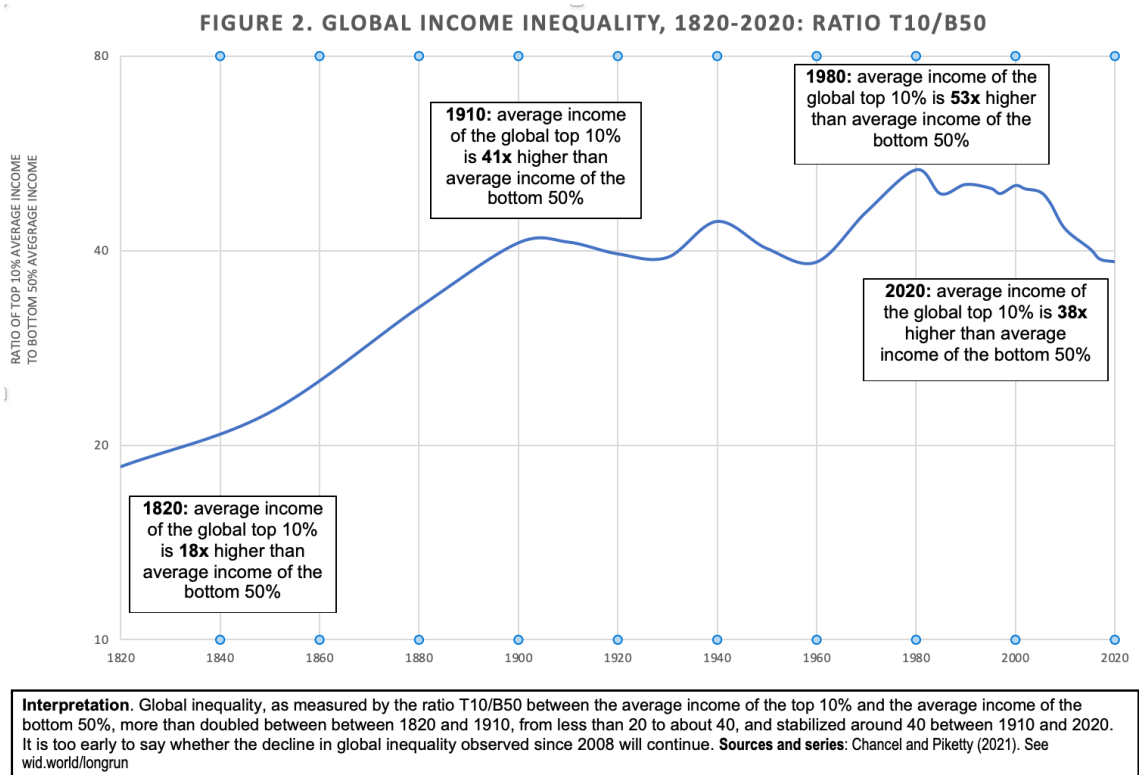


Figure 2 – Global Income Inequality, 1820-2020: Ratio T10/B50 (Chancel and Piketty, 2021)

Generally, Chancel and Piketty (2021) identify a pattern of increasing inequality between 1820 and 1910, both among countries and within countries. After 1910 they noticed a new pattern. The two components of global inequality, among and within countries, moved in opposite directions between 1910 and 2020. Within countries, inequality decreased from 1910-1980 but rose in 1980 to 2020 while inequality among countries

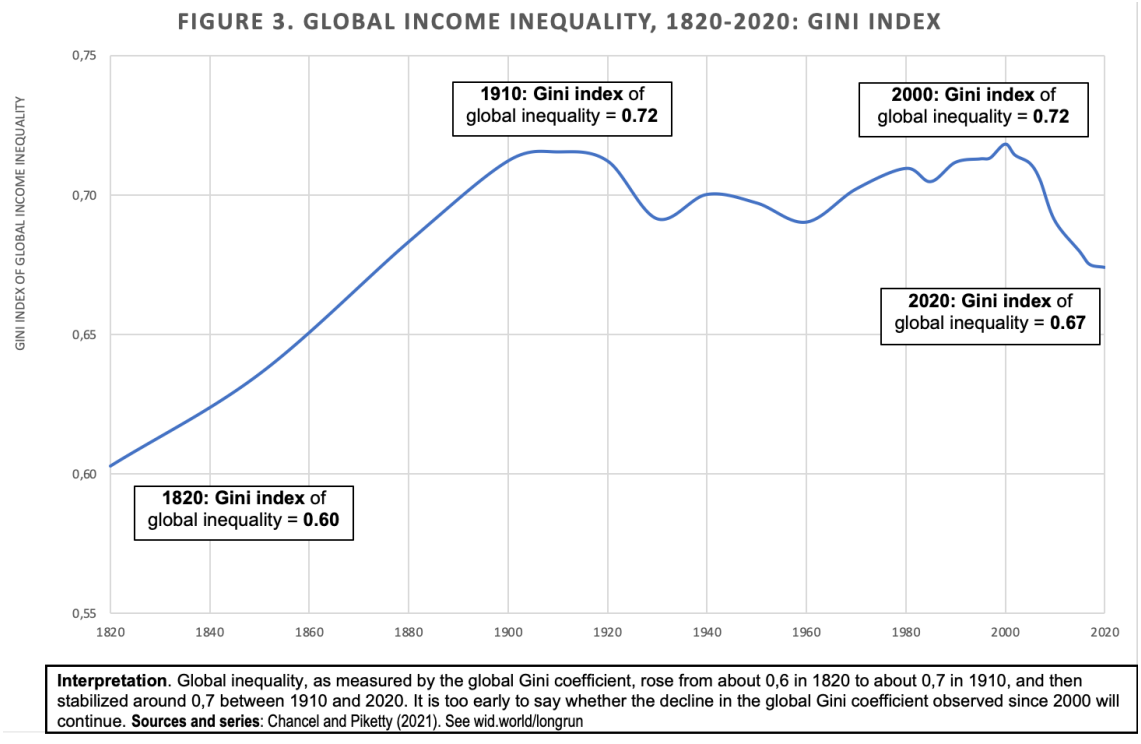


Figure 3 – Global Income Inequality, 1820 – 2020: Gini Index (Chancel and Piketty, 2021)

increased from 1910-1980 and started to decline in 1980-2020. This trend is also revealed in a review from

Ravallion (2018), who states that given historical patterns, global inequality was on a rising trend from 1820 to about 1990 and sees a fall in the new millennium. This statement is based on an analysis by Bourguignon (2016) using the Theil index (see Figure 4). The analysis obtained by using the Theil index reveals the most recent trend in inequality, the new pattern of falling global inequality, alongside rising average inequality within countries markedly in the new millennium

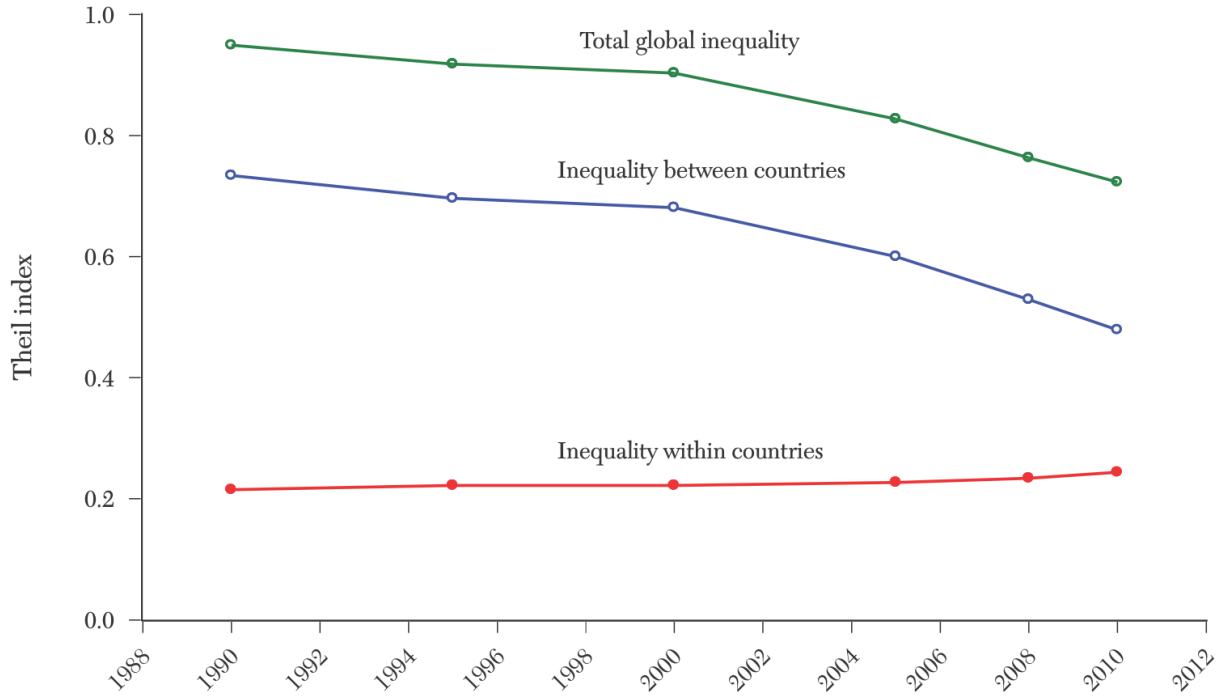


Figure 1. Global Inequality and its Between- and Within-Country Components

Source: Created from data in Bourguignon (2016, table 1)

Figure 4 - Theil Index (Bourguignon, 2016)

The trend of growing income inequality within many countries and the relatively declining income inequality among countries is also captured by the World Social Report 2020 by the United Nations. They conclude that since 1990, income inequality has increased in most developed countries and in some middle-income countries, including China and India, based on data from the World Inequality Database. Yet growing inequality is not a universal trend. In most Latin American and Caribbean countries, as well as several African and Asian countries, the Gini-Coefficient of income inequality has decreased in the recent two decades. They further draw attention to the fact that income and wealth are increasingly concentrated at the top. According to the report, the share of income going to the richest 1 percent of the global population increased in 46 out of 57 countries and areas with data from 1990 to 2015.

Another method to capture global inequality, a method by Lakner-Milanovic, has resulted in a graph which is known as the "Elephant Curve". It is called "Elephant Curve" because the graph resembles the shape of an elephant's head with its trunk up high. This method represents the distribution of global growth by plotting the cumulative income growth of each decile of the global income distribution. The result has been summarised by Chancel and Piketty (2021) for a period from 1980 to 2020 as follows: the sixth to ninth deciles of global income did not benefit much at all from global economic growth in this period, thus lagging behind world growth. By contrast, the bottom 50 percent have captured 9 percent of growth and the top 1 percent have captured 23 percent of growth. To classify this result it is useful to think about the scenario in which global income distribution was stable. In that case, the curve would be flat and each percentile would progress at the same rate as all others. In reality, the curve shows that the wealthiest households in the wealthiest countries gained the most, namely those at the tip of the elephant's trunk.

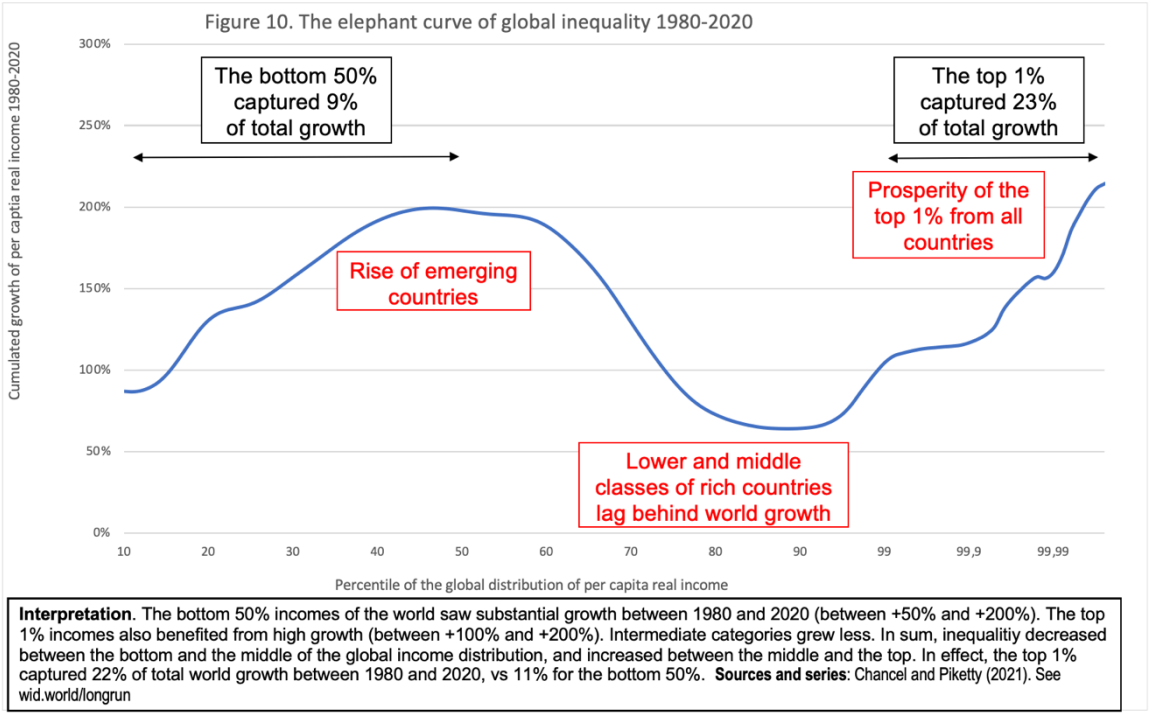


Figure 5 - Elephant Curve (Chancel and Piketty, 2021)

In the paper "World changes in inequality: an overview of facts, consequences and policies" Bourguignon (2017) concludes: "Whatever the way income inequality is measured, inequality is greater today than it was 25 years ago in a majority of advanced countries and some emerging countries". However, only a few countries exhibit a continuously rising trend for all inequality indicators. Regarding the revival of within-country inequality after 1980, Piketty describes some possible interpretations of its implications in the first chapter of his book, *Capital and Ideology* (2020). He raises the question of how to evaluate and interpret these developments. A possible interpretation of the rise of inequality that he points out is that inequality stimulates growth and innovation. He gives the example of artificially kept and excessively low level of income inequality under the Russian and Chinese Communism before 1980. The increase in inequality, after the end of the regimes, appeared to be beneficial for all, by stimulating growth and innovation. Another positive implication of rising inequality can be found in the special case of China where the poverty rate has decreased

dramatically. Piketty then draws a line to India, Europe, and the United States, to postulate similar arguments for this interpretation. Yet he rolls out arguments which, based on data, show that for instance, national growth decreased in the United States after 1980, which is the period in which inequality started to rise again. He draws attention to the fact that the interpretation of the data should be conducted carefully. Regarding trends in economic inequality within countries the OECD states in their World Social Report (2020) that in most developed countries income distribution has grown over the past 30 years. Yet they note that trends differ among countries. The differences moreover depend on the period and on the indicator used. They find that inequality in all regions experienced phases of expansion and decline, when measured by the Gini Coefficienct.

2.3 Inequality in European and Anglo-Saxon countries

2.3.1 The Rise of Inequality in European and Anglo-Saxon countries

Along with global warming, the rise of inequality is one of the principal challenges confronting the world today (Piketty, 2020, p. p. 656). Since the 1980s socioeconomic inequality has increased in all regions of the world. Politicians and journalists depict with increasing frequency in inequality as a threat to social stability, laying the blame on globalisation and its attendant, so-called, neo-liberal policies (Bourguignon, 2017). However, as already discussed above, growing inequality is not a universal trend and there remain still stark disparities between western economies and less developed economies. I will further investigate the trends of rising inequality during the past 40 years, with a focus on European and Anglo-Saxon countries. In this section, I will set the focus on the evolution of inequality in 15 selected countries. First I will give a brief review of ongoing developments, then I will present data regarding inequality trends in the selected countries and give possible interpretations and implications of these trends I will group these countries into three categories, Anglo-Saxon countries, Mediterranean countries, and Northern/Central European countries. Finally, I will present some factors which drive the ongoing trends, like technological change, changes in economic structure, the skill-biased labour markets and policy changes regarding the labour market, or other factors.

2.3.2 Review on income inequality in European and Anglo-Saxon countries

A paper by Blanchet, et al. (2019) provides evidence about distributional national accounts and displays inequality in Europe from the last forty years. Their results show that inequalities have risen in a majority of European countries since 1980. This result is based on data that reveals a long rise in pre-tax income disparities. They find that the top 10% pre-tax income shares in Europe increased in all European countries from 1980 to 2017. For example, in Germany, the top 10% income share rose from 28% to 35%. They further find that European inequalities are primarily caused by inequalities within countries. Also, this trend is conforms with the global trend. However, one of their analyses (Figure 6) shows that Europe has been more successful than the US at containing inequalities. Their results lead the to following conclusion: “Despite

rising income disparities since the 1980s, driven by fast-growing incomes at the top, Europe remains the least unequal region of the world, thanks to a more equal distribution of income before taxes and transfers."

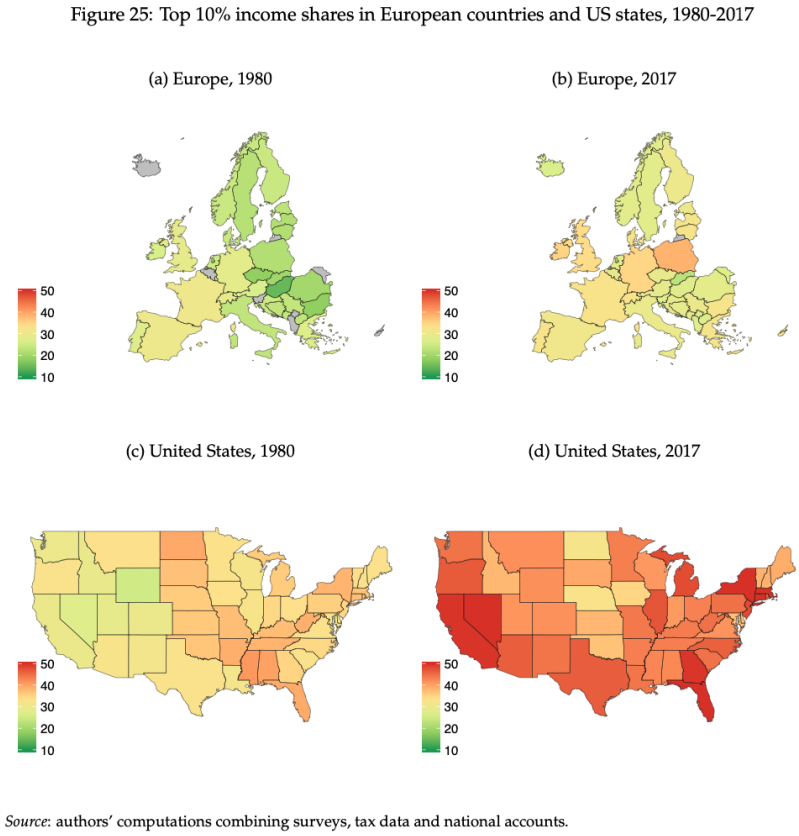


Figure 6 - Top 10% Income Shares in European countries and US states (Blanchet, et al. 2019)

François Bourguignon concludes from his research about World Changes in Inequality (2017), in which he examined the rise of inequality in developed countries in particular, that changes in inequality appear to be very country-specific. The analysis of Bourguignon from 2017 shows three trends or patterns of how inequality evolved over the period from 1985 to 2012. These are first, a rising trend in inequality, second, a one-step rise in inequality, and third, a decline in inequality. European countries identified with a rising trend in inequality are France, Denmark, and Sweden. European countries classified as one-step rise countries are Austria, Finland, Germany, Italy, and Spain. And finally, the European countries with a declining trend in inequality are Belgium, Greece, Ireland, The Netherlands, and Portugal. These trends have been determined by making use of the equivalized household income and then have been visualized in the form of a time-series of Gini Coefficients.

Blanchet, et al. (2019) find that the rising inequalities in Europe are mainly happening at the top of the income distribution. However, the risk of these increase in income inequality does not lie in top earners becoming richer but the Europeans at the bottom of the income distribution who are at risk of poverty. A paper by Bughin and Pissarides (2019) provides more insights into the increased inequality. In the paper, they present results from testing the resilience of Europe's inclusive growth model. They find a link between countries that have been hit most by the financial crisis of 2007 and inequality. Accordingly, they state, that countries in that

cluster experienced an increase in inequality. They argue that this increase in inequality results, among other things, from a cut back in social spending in the aftermath of the financial crisis of 2007. Similar research was conducted by the McKinsey Global Institute (2018) which results suggest that there is upward pressure on inequality which could intensify as a result of the interaction of six global trends. They name these trends as aging demographics, digital change (digital technology, automation and aritficial intelligence), increased global competition and migration, climate change and pollution and shifting geopolitics. These findings raise concerns about the increasing inequality and the possible outcomes in case the trends continue. Bighin and Pissarifes (2019) (Bughin & Pissarides, 2019) state that in case of no response the effects would result in prolonged secular stagnation, inequality would continue to rise and welfare costs would grow. The conducted simulation (see Figure 7) suggests that the megatrends could lead to a reduction in baseline income growth from an average of 1.6% per year to 0.3%, which would be an 85% drop. They conducted an estimation about the Gini Coefficient for 2030 (Market Gini index and Net Gini index). The results indicate that there will be a social divergence within the EU28, meaning an increase in inequality between European Countries. Their results further deliver a scenario, which shows that the Mediterranean countries of Southern Europe will fall behind in comparison to the Nordic economies. Their argumentation for this divergence is that the

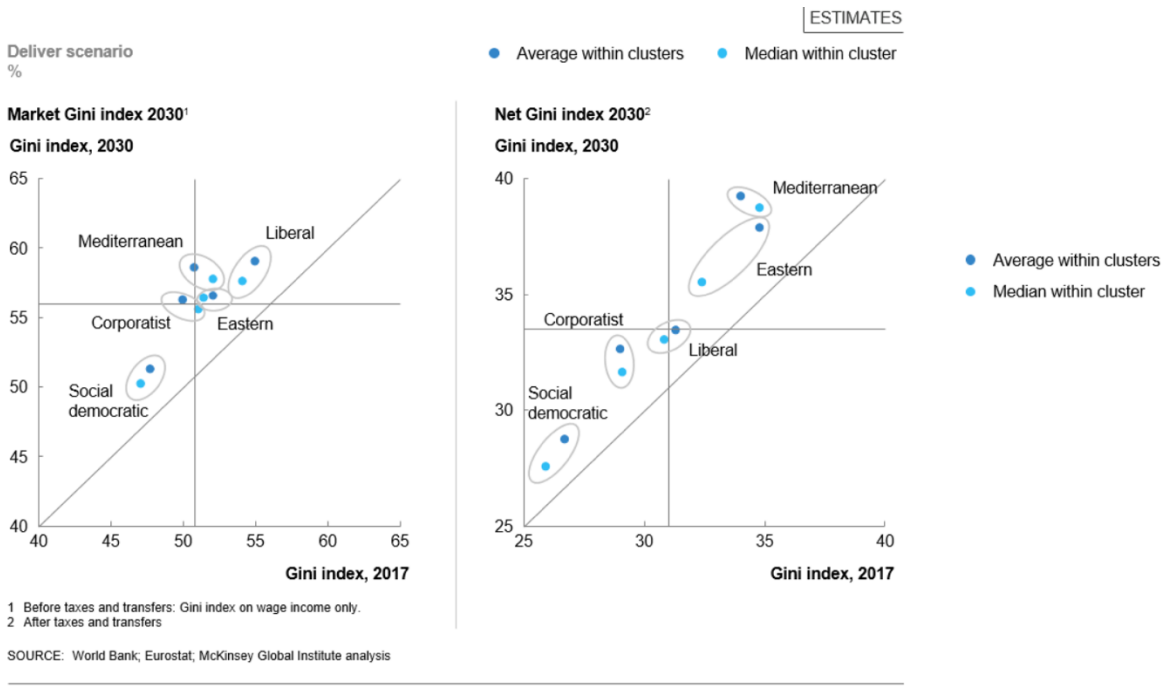


Figure 7 – Estimations Development Gini Coefficient (Market Gini and Net Gini) by 2030 (Bughin & Pissarides, 2019)

Mediterranean countries will still lag behind because of the financial crisis of 2007.

Regarding Europe, the financial crisis is said to have slowed the rise in top income inequality, but income gaps between the middle and the bottom of the distribution have continued to widen, especially lower incomes have lagged behind (Blanchet, et al., 2019). Bighin and Pissarifes (2019) results further suggest that for the Mediterranean countries all income deciles and quintiles will have lost between 1% and 3% a year of disposable income per capita, with the largest losses to be incurred at the lower-income households. In contrast to that, the Nordic economies show real positive growth in per capita income and only a slight increase in

inequality due to superior income growth in the top decile. Bughin and Pissarides (2019) conclude that challenging times, politically and economically, lie ahead. And they state that: "history has taught us that nations emerge from uncertain societal transitions by taking rapid action, engaging in fresh thinking, experimenting with new models of social contracts, and using social protection as an insurance against failure". When looking at the United States however research shows that pre-tax inequality has risen more than in Europe since 1980 (Blanchet, et al., 2019). Blanchet et al. find that income differences between the United States and Europe are mostly driven by top incomes. Blanchet et al. further provide an interesting insight into the evolution of top 10% income shares since 1980. They designed a map that indicates the share the top decile holds in respect of the total income. The graph clearly shows that income shares of the top 10% have skyrocketed in the United States over the observed period. The graph further gives insights into the geographical disparities and indicates that income inequality is particularly high in New York and Florida (reaching up to 60%) or in California.

2.3.3 Trends in income distribution

In the following section, I will display the evolution of income distribution for a selection of countries over the past 40 years, from 1980 until 2019. I will use the Gini Coefficient to get a picture of income inequality in the selected countries. The countries I selected are Austria, Canada, Denmark, France, Germany, Greece, Ireland, Italy, Netherlands, Norway, Poland, Portugal, Spain, Sweden, the United Kingdom and the United States of America. I will categorize these countries into three groups and conduct my analysis' according to these groups. The three groups are: Anglo-Saxon countries, Mediterranean countries and Nothern / Central European countries. I will show how the income evolved by displaying the bottom 50% and the top 10% of the income distribution. The data for this analysis is retrieved from OECD Data and the World inequality database, which is a database on the historical evolution of the world distribution of income and wealth, both within countries and between countries.

Gini Coefficient

The following chart shows the Gini Coefficient of each selected country. The depicted Gini Coefficients are based on the latest data available, which ranges from 2016 until 2019. One can easily see, that in the United States income inequality, with an absolute value of 0.39 from 2017, is higher than in the other countries. The United States is followed directly by the United Kindom, and then by the Mediterranean countries. The country with the lowest inequality based on the Gini Coefficient is Norway, followed by Denmark. This graph indicates that in the Anglo-Saxon countries inequality is higher than in the European countries and that the Northern European countries have the lowest inequality.

Analysis of evolution of Income

For the following analysis, I retrieved historical data about the income distribution of the 15 countries. I grouped them according to their geographic areas into three subcategories. The first group is the group of the Anglo-Saxon countries and includes Canada, Ireland, Great Britain, and the United States of America. The second group is formed by the Northern / Central European countries and consists of Austria, Denmark, Germany, Netherlands, Norway, Poland and Sweden. The last group consists of Mediterranean countries, which are France, Greece, Italy, Portugal and Spain. I visualized the evolution of the income shares to reveal the trends of the past 40 years. With the analysis, I am able to draw interpretations and highlight differences between these regional groups.

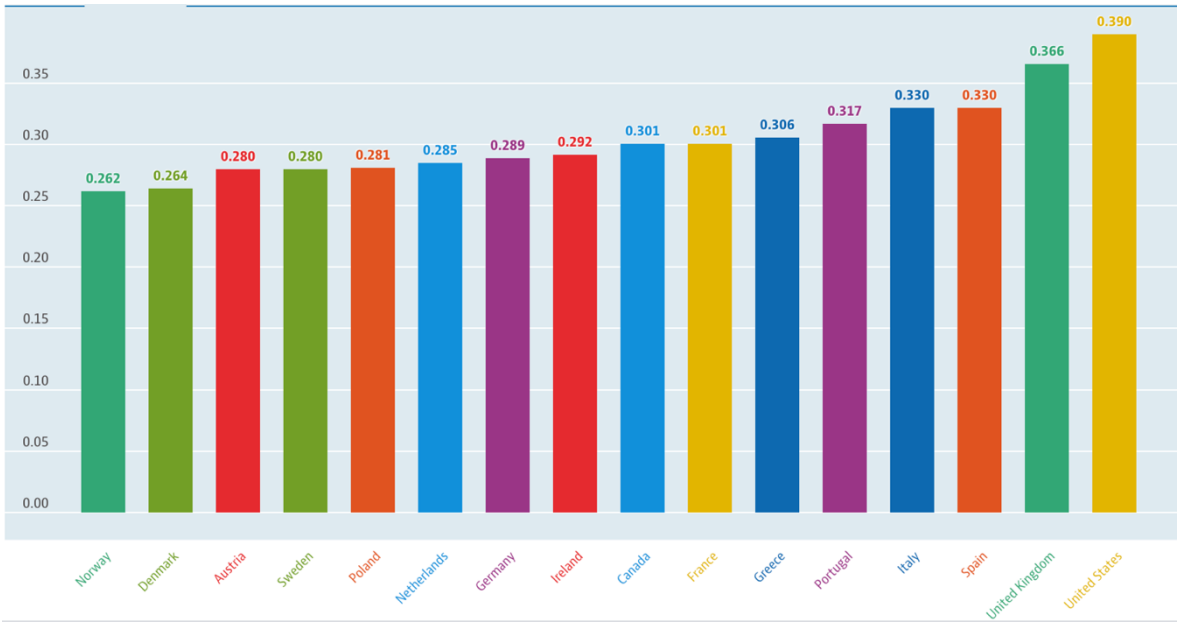


Figure 7 - Gini Coefficients as of 2019, or the most recent available (OECD Data)

Evolution bottom 50%

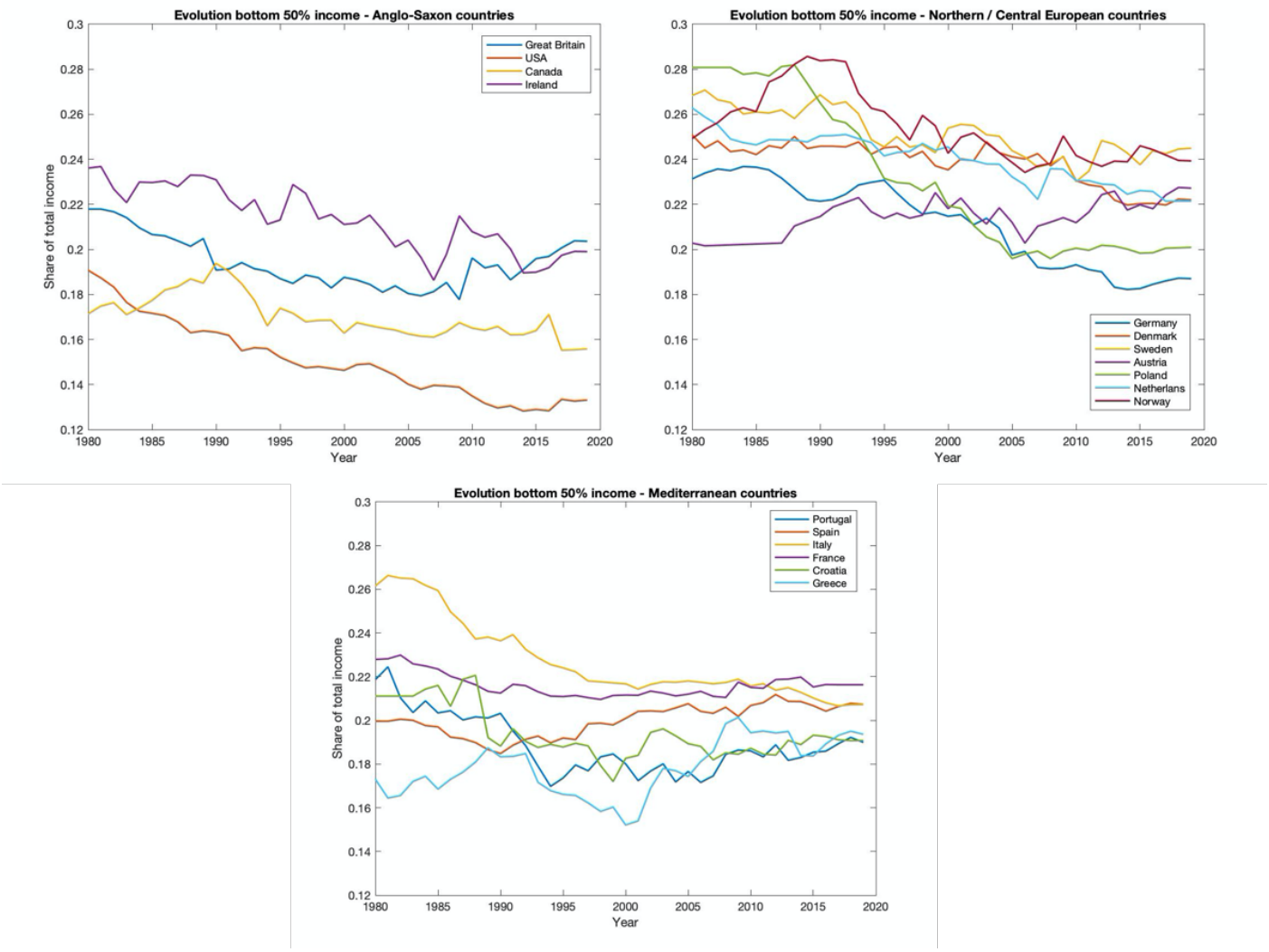


Figure 8 – Evolution of bottom 50%, based on data from the World Inequality Database

This overview of the evolution of the bottom 50 percent share of the income distribution over the periods from 1980 until 2020 provides insights about trends in income distribution over the last 40 years. In the case of equality, this share should hold at 0.5, which would then account for 50% of the national income. The data reveals that income is distributed unequally and that the trend of inequality is increasing. In the case of the Anglo-Saxon countries, the share of the total income of the bottom 50% in the income distribution has decreased over the last 40 years. In 1980 the share oscillated around 0.17 and 0.24 percent and now oscillates around 0.2 and 0.14 percent, with the United States marking the lowest percentile. While every one of those four countries depicts a decline, Great Britain seems to have reversed the trend since the lowest point during the financial crisis. Overall the decline for Great Britain during the last 40 years results in a ~0.1% decline. The trend of decreasing share of income for the bottom 50% can also be observed for almost all the Nothern / Central European countries. The only country in which the bottom 50% did not increase over the observed period, is Norway. However, in comparison to the Anglo-Saxon countries, the bottom 50% initially (1980) oscillate at a higher level, between 0.2 and 0.28 percent, and remain even after the drop at a higher level, between 0.18 and 0.24 percent. Here Germany marks the lowest percentile at the end of the period and Poland experienced the strongest fall. The evolution of the bottom 50% of the Mediterranean countries indicates a

similar trend. At the end of the observed period, the share of income of the bottom 50% oscillates around similar levels like the rest of the observed European countries, between 0.19 and 0.22 percent. The two countries in this group in which the share of income of the bottom, 50% have increased over the past 40 years are Greece and Spain, however, the increase was overall not very strong. The bottom 50% in Greece experienced a strong increase in the early 2000s, just before the financial crisis. Given the development of the bottom, 50% already indicates, that in almost all countries inequality has increased during the last 40 years. The only countries in which the trend appears to be different are Great Britain, Norway, Greece, and Spain. To further interpret the developments in these countries it will be useful to better understand politics, policies, and the general labour development in those countries over the past years.

Evolution top 10%

Figure 9 – Evolution top 10% based on data from the World Inequality Database

The evolution of the top decile of income provides more insights into how inequality developed over the past 40 years. In the Anglo-Saxon countries, the top decile in the income distribution has gained income share over the past 40 years. In the four countries in 1980 the top decile share was around 0.3 and 0.35 percent and has increased by about 0.05 percent share. In the United States, the share of total income even increased by 10 percent, to 0.45. The data from Northern / Central European countries reveals similar trends. Only in Austria,

the share did not increase. Like the evolution of the bottom 50%, Poland records the strongest change, and together with Germany Poland marks the highest share of income for the top decile at about 0.37, which is similar to the lower Anglo-Saxon countries in 2019. Regarding the Mediterranean countries, the graph indicates that the shares of all countries have converged towards 0.35. Again Greece and Spain do not show significant changes over the observed period.
Interpretation: The figures of the evolution of the top decile are conformed with the development of the bottom 50%. Generally the notion of an increase in the share of income for the top decile combined with the decline in the share of income for the bottom 50% speaks clearly for an increase in inequality. Over the past 40 years, inequality appears to be most significant in the United States of America, Germany, and Poland. The country in which inequality remained rather stable is Norway.

The results from the analysis suggest that despite the increasing trend, inequality remained lower in the European Union than in the Anglo-Saxon countries. The results further indicate regional differences, like the difference between northern Europe and the Mediterranean countries, which leave room to further investigate the efficiency of the policies and regimes in handling inequality.

2.4 Driving forces of inequality

In the following chapter, I will discuss the driving forces of inequality. There are different trends and forces which cause the trends in inequality. A general conception is that globalisation and technological change are the main drivers of inequality. Bourguignon (2017) summarizes: “Almost by definition, globalisation and technological progress are the most obvious common factors of income distribution changes across countries”. Instead, the World Social Report (United Nations, 2020) identifies four megatrends that are driving forces in inequality. These four megatrends are technological innovation, climate change, urbanization, and international migration. Each of these megatrends impacts inequality in a different dimension. Next to these driving factors for inequality, other factors such as taxation policies, capital market imperfections, globalisation or climate change are taken into account. In the following, I will discuss more in detail the driving forces technological change, changes in economic structure, skill-biased labour markets and some other factors which influence inequality.

2.4.1 Technological Change

The next force which will be discussed in detail is technological change. The World Social Report (United Nations, 2020) argues that the technological revolution brings along disruptive technological breakthroughs. The advances in all kinds of technology, such as biology and genetics, robotics, and artificial intelligence, 3D printing and other digital technologies, bring about great opportunities and challenges. Digital innovation and artificial intelligence are opening opportunities for equality thanks to easier access to financial services, health care and online courses. These innovations have far-reaching implications for equality, if everyone has equal access to it. Yet, the challenges of technological innovation, like job disruption and education gaps could lead

to an even greater divide. Disappearing jobs, as tasks become automated, would mainly affect low-skilled and middle-skilled workers. Meanwhile, technological advances favor high-skilled workers. Gaps in education can widen if new technologies primarily benefit those pursuing tertiary education or disproportionately improve the learning outcomes of children in wealthier families. This is also described by Daron Acemoglu (2002) as the technological change skills-bias. He argues that technological change during the period from 1940 to 2000 has been skill-biased. This supports the recent consensus that technological change favors more skilled workers, replaces tasks previously performed by the unskilled, and exacerbates inequality. He bases his argument on the fact that the United States has seen a large increase in the supply of more educated workers during the years 1940 to 2000, while returns to education have risen, in form of a skill premium. Accordingly, he concludes that if there had been no substantial skill-biased, the skill premium would have been depressed by the large increase in the supply of skilled workers. This is also supported by Richard Nelson and Edmund Phelps (1967), Finis Welch (1970), Theodore Schultz (1975), and Jan Tinbergen (1975) who argued that technological developments increase the demand for skills. It is interesting to notice that the phenomenon that technological advances favor more skilled workers emerged in the twentieth century. Acemoglu (2002) describes how in the nineteenth-century Britain skilled artisans were replaced by new machines. During that period the purpose of technological change was to simplify tasks and divide the tasks previously performed by artisans by breaking them into smaller, less skill-requiring pieces. Thus technological change may not have always increased the demand for skills and there has also been a change in the potential of technological change. The report of the OECD (2020) underlines that the potential of new technologies that may foster sustainable development can only be realized if everyone has access to the technologies and is able to use them. Thus, if the access is not ensured, new technologies could exacerbate inequalities by reinforcing various forms of inequality and creating new "digital divides", instead of reducing them. The report calls for three key policy interventions. First, to invest in skills that enable workers to perform new tasks over a lifetime and to become more resilient to the changing environment. Second, to secure universal access to social protection to support people. Social security systems should properly address the consequences of rapid technological progress on workers and households. Third, policy should strengthen efforts in bridging technological divides within and among countries, including investing in infrastructure. An enabling infrastructure requires investment in connectivity, especially in historically marginalized communities.

Technological change is further reinforced and linked to globalisation. A popular opinion is that in developed countries the interaction of globalisation and skill-biased technological progress is responsible for the increase in the top income share, as income goes to capital and for slow growth of wages and employment of unskilled labour (Bourguignon, 2017). Bourguignon based this statement on a framework of international trade by Hecksher-Ohlin. The link between globalisation and wage inequality is further discussed by Acemoglu (2000). He links globalisation and technological change in the respect to wage inequality. Acemoglu (2000) states that increased international trade may have been an important factor in the rise of wage inequality by affecting the degree of skill bias of technological change. He bases this argumentation on a standard trade theory which

predicts that trade increases with less developed countries, which are more abundant in unskilled workers, the demand for skills in the domestic labour market should increase.

2.4.2 Changes in the economic structure

Recent changes in economic structure also cause inequality to rise. These changes are strongly driven by the globalisation and are for example the financialisation, the deregulation of public entities and privatisation. Globalisation can have an impact on polical regimes. For example, Bourguignon (2016) and Milanovic (2016) point out, that events such as the collapse of the former Soviet Union and the long period of stagnation in Japan can reasonably be attributed to globalisation. With that connection, they draw attention to other, politically and socially, factors that have influenced globalisation and have had an impact on inequality.

Another channel that leads to changes in economic structure to mention here is financialisation. Bourguignon (2017) describes in his paper on World Changes in Inequality the financialisation which came along with globalisation. He argues that financialisation worked in favor of capital income and inequality at the top of the distribution by rising pressure on the shareholders' value of companies. Another consequence of the financialisation is that the compensation of top executives and employees in financial intermediaries rose as well with the rising pressure on shareholders' value of companies. In his paper on inequality and globalisation Ravallion (2018) points out other covariate changes across regions and countries. These are technical innovations, institutional changes like deregulation, labour-market liberalization, less progressive income taxes, and less generous welfare benefits in some rich countries. He points out that some of these factors might stem indirectly from globalizing forces. Concerning other factors influencing inequality through globalisation Bourguignon (2016) and Milanovic (2016) link technology, trade openness, and policy by stating them to be independent. Yet Ravallion (2018) writes: "I think the scope for independent policymaking is being understated.", and positions himself as not being confident in identifying trade openness as an important driving force of inequality. Rather he follows the opposite opinion by arguing that trade has helped promote growth and poverty reduction in the developing world as a whole. This argument conforms with the recent decline in global inequality and a report about the major forces behind the increase of income inequality by the OECD (2011). In the report, the OECD argues that neither trade openness nor financial integration has been empirically important factors in explaining rising inequality.

In the paper "World changes in inequality: an overview of facts, causes, consequences and policies" by Bourguignon (2017), he discusses factors that contribute to change in inequality. First, he identifies some factors to be idiosyncratic, based on the results he derived which show that inequality develops heterogeneous, thus the factors driving inequality are not homogeneous. Next to globalisation, technological change, institutional factors, redistribution policies (taxation and cash transfers) and labour market regulation (minimum wage), he identifies exogenous changes in the demographic structure of the population and in some key dimensions of economic behavior to be having a potentially powerful effect on the inequality. He specifies these to be the following factors: change in the age and educational structure of the population, in the composition of households, in particular the importance of lone parenthood, marriage or cohabitation behavior,

fertility, assortative mating, and labour force participation, especially of women. He states that it is possible to get a good estimate of first-round effects through micro-simulation methods. But it is more difficult to take into account the general equilibrium impact of those changes. However, this contribution widens the scope of possible driving factors and makes the question of how and whether to tackle the issue of inequality even more complex.

2.4.3 Skill-biased labour markets

Labour-market policies

In the following section, I will discuss the effects of labour-market policies on inequality. Considering merely income inequality, there are numerous policies to counteract the increase of inequality to ultimately prevent poverty, which may arise as a consequence of increasing inequality. There are different labour market policies and systems in developed countries which reached different outcomes. Acemoglu (2000) notices a difference in the development of inequality between United States and the United Kingdom in contrast to continental European economies. He states that while wage inequality increased substantially in the United States and the United Kingdom it remained stable in many European countries. He explains these differences with a hypothesis by (Krugman, 1994) which maintains that the reason why inequality did not increase as much (or not at all) in Europe lies in Europe's labour market institutions. These institutions encourage wage compression and limit the extent of inequality. Accordingly, Acemoglu (2000) suggests that the wage compression in Europe originates partly in that the minimum wage, strong unions, and generous transfer programs. Regarding this matter, Bourguignon (2017) analysed the case of the United Kingdom in which inequality increased vigorously in the second half of the 1980s and saw a little downwards trend afterward to stabilise until the end of the period analysed. This trend is also called a one-step change, which he found as well for Germany, Canada and Finland. He states that these events of a one-step change often coincide with specific events or reforms in the corresponding countries. These are namely the Thatcher reforms in the United Kingdom, in Germany the Hartz laws and wage moderation, or Finland the recovery after joining the European Union. Bourguignon (2017) further discusses the Harz laws in Germany, where he states that the Harz laws as a major cause of the increase in inequality are rather weak. The Harz laws reformed the unemployment compensation system and some other aspects of the labour legislation. He states several other factors which possibly caused the rise in inequality in the 1980s and early 1990s. These factors are the deregulation of several key sectors, including public utilities and privatisations. These elements are mentioned by Bourguignon as possible reasons in both developed and developing countries.

Globalisation

Globalisation is an important factor regarding the recent changes in labour markets and has further implications on inequality. Based on a framework on international trade globalisation is linked to changes in the labour structure. In his paper on Inequality and Globalisation Ravallion (2018) also considers the effects of globalisation on the labour market. He describes the possible negative effect of globalisation on the labour market as follows: rich countries claim that globalisation has destroyed jobs at home and led to stagnant or

falling living standards for all except the wealthy citizens, said to be in favor of the globalisation, benefit from the globalisation through financial and human capital. Other opinions support the globalisation in respect to the labour market. Supporters argue that the globalisation has brought gains to the developing world's poor countries, for instance through the jobs which have been created there. An interesting answer reveals the elephant graph to this issue by suggesting that there is truth on both sides, as the elephant curve indicates that the gains of globalisation are not evenly distributed, but rather concentrate on the top and at the bottom of the population regarding the income distribution. To conclude, it can be said that the process of globalisation has shifted relatively low-skilled jobs from developed world to labour-abundant low wage countries. This means that the contribution to the within-country component of global inequality was driven up, especially in developed countries and the between-country component of global inequality was driven down.

2.4.4 Other explanatory factors

Globalisation

In order to investigate the impact of globalisation on inequality it is helpful to define globalisation. Globalisation is primarily a greater economic integration across countries, which mainly means greater openness to external trade and greater mobility of financial capital (Ravallion, 2018). Ravallion further states the argumentation of a much popular opinion today which is that global economic integration has been the major force in the evolution between and within countries. It is said that in the present period, globalisation can be seen as the joint cause of both falling inequality between countries and rising inequality within countries. The globalisation can affect inequality through different channels. One channel is the labour market, another channel are political responses to globalisation or through the financialisation.

Kuznets waves

Another explanation for the developments of inequality could be found in an approach by Milanovic. Milanovic identifies a reccurring pattern in inequality. In his book on Global Inequality (2016) he introduces the idea of what he calls "Kuznets waves". It is a short coherent economic history of the long-run evolution of inequality within countries. Based on historical data and events he sees waves in which inequality rises and falls. Therefore he implies that the present period of rising inequality in many rich countries will come to an end at some time. His argumentation is more an interpretation of history than an economic analysis and is mainly based on the "inequality shock" capitalist countries experienced through the First World War. (Ravallion, 2016).

Education

Ravallion questions the role of education policies when pursuing the objective to reduce inequality in drawing attention to the rise in inequality in some rich countries, it can be assumed that education is generally high. Glodin and Katz (2008) argue that rising earnings inequality in the United States since 1980 stems in no small measure from the fact that the American education system has not allowed the supply of the types of skilled labour required for the new technologies of the time to keep up with the demand. Yet it stands in contrast to the role equitable education played in the rapid growth in the United States from 1940 to 1980.

Climate Change

The next factor I want to discuss is climate change. Although climate change as a driving factor of inequality is not encountered too often in existing literature, I see this as a crucial factor that needs to be taken into account as well. The risk of climate change on inequality gains especially on relevance due to the ongoing pandemic of Covid-19. The risk of climate change on inequality is especially relevant due to the ongoing pandemic of Covid-19. The risk of pandemics increases with climate change and will be discussed in the following, pose an increased risk of inequality. Not only the pandemic of Covid-19, but also extreme floods (in Germany and China) and wildfires (in Turkey, Greece and Italy), as they have occurred this year (2021), indicate another risk to inequality. Climate change is accelerating environmental degradation and increasing the frequency and intensity of extreme weather events, among other impacts (United Nations, 2020, p. 7). Such extreme events and sudden shocks then disproportionately affect vulnerable populations. In the report, they identify many dimensions through which climate change affects households with lower income unproportionally more than houeholds with higher income, starting with the disproportional exposure to climate change of people living in poverty or other disadvantaged groups. The higher exposure can lie in a higher dependency on agriculture, fishing, and other ecosystem-related income or people living in poverty being more affected by infectious and respiratory diseases. They are generally more vulnerable to price shocks caused by sudden changes, natural disasters and environmentally triggered health problems. This higher exposure, compared to their richer counterparts, is combined with the fewer resources they have to cope with and recover from a crisis which contributes to inequality. People will find it harder to escape poverty and are increasingly vulnerable to fall into poverty. In the UN report, the opportunities which arise with climate action and the transition to green economies are laid out. With the restructuring of economies to be greener, there will be a loss of lower-skilled jobs in carbon-intensive sectors and with carefully designed adaption strategies, it can result in the creation of many new jobs and value creation. Policies designed to reduce poverty and inequality can be incorporated with reducing the negative effects of climate change and simultaneously provide the means for low-income households to engage in environmentally sustainable livelihoods.

Demographic Change

Especially, when considering developed countries, the recent changes in demographic change are shown to have a potentially powerful effect on income inequality (equivialised disposable incomes), even though this effect may be indirect (Bourguignon, 2016). An important factor here to mention is the rising trend of single-headed households (lone parenthood). A single-headed household is more likely to face higher levels of expenses and will be less able to build up savings (Memon, et al., 2019). Additionally, also changes in the age structure of the population are to mention here, as elderly population groups in principle do not contribute to the economic activities but obtain financial support from the government. Accordingly, the elderly population rather constitutes a liability on the state resources, which could otherwise be spent on other public services, such as education.

To conclude this section I want to state that identifying the causes of inequality is a complex and wide issue. Generally, inequality seems to be influenced by many different factors, which makes it more complex to successfully tackle the issues. Yet, it can be said that much research has been conducted and there is a broad knowledge base that can be used to address the issues. The World Social Report states that to counterfeit inequality it is important to ensure equal opportunities, which may be harvested by attributes like age, sex, disability, race, ethnicity, origin, religion, and economic or another status. It can be concluded that reducing the inequality in endowments of human and financial capital is seen as key. The scope for assuring a more equal distribution of endowments includes education policies, inheritance taxes, greater worker equity in firms, and greater financial inclusion. Regarding the three groups I chose for my analysis, all the above mentioned factors are relevant when considering inequality in these countries.

3. Policies against inequality

The different levels of inequality, decribed in the previous section, indicate that there are different methods to tackle the trend of increasing inequality. Different kinds of economic policies exist to mitigate the effects of income inequality and to ensure that also the individuals at the bottom of the income distribution can cover their basic needs. A possible way to distinguish between policies is to consider whether policies are designed to address persistent inequalities or to mitigate the effects of temporary aggregate shocks, such as recessions, the financial crisis, or pandemics. The quality behind these differences lies in the intention behind the policies. The intention behind policies that are designed to address persistent inequalities is to reduce poverty and market inequality. The intention behind policies which are in place as a response to temporary aggregate shocks and are to ensure people against these shock irrespective of their pre-shock income position. Considering the policies which are designed in the first place to address persistent inequalities one can further subcategorize these into pre-distributive and redistributive policies. In the following I will further discuss the exisiting policies which are designed to tackle exisiting inequalities. However, it should be noted that there are temporary policies as a reaction to economic shocks, which may also address inequality. For example throughout the financial crisis or other previous recession.

3.1 Policies address to persistent inequalities

As the previous sections show, there are different trends and levels of inequality. These can be partly attributed to the different social regimes and welfare systems in the countries. This raises the question of why the trends are so different and encourages investigating the efficiency of these regimes and different policies. Research has shown, that pre-distributive policies are more effective in Europe than in the US. In “Unequal unions?” (Filauro & Parolin, 2019) for instance, they reveal that despite the greater relative heterogeneity in the European Union, its level of income inequality has been consistently lower than that of the US from at least 2006 onwards on. They argue that these differences originate in the strength of national welfare states across the EU. Another piece of research (Blanchet, et al., 2020) investigated why Europe is more equal than the US.

They find that the redistributive policies are equally efficient in both the EU and the US. They find evidence that taxes and transfers contributed to limit the rise of inequality in European countries that were not more progressive in Europe than in the US. They, therefore, conclude that European countries have been more successful at containing the rise of income disparities than the US.

3.1.1 Redistributive policies

In the following, I am going to discuss existing policy tools that are designed to redistribute national income to mitigate income disparities across a nation and mainly to prevent poverty. The most popular policy is progressive income taxation combined with government transfers. As stated in an OECD report, redistribution is used synonymously with inequality reduction reduction (Immervoll & Richardson, 2011). Accordingly, tax and benefit payments are redistributive if they reduce inequality, regardless of the extent to which this is achieved through actual or implicit transfers from higher to lower-income groups. The effects of government policies on household incomes through taxes and transfers can be seen and measured directly.

Taxes

Most countries have a progressive tax system on income and wealth. Research has shown that these systems are less progressive in Eastern Europe in respect to Western and Northern Europe. Next to income taxes, another type of tax to reduce inequality is the inheritance taxation. Inheritance taxes are an important tool to dampen the persistence of wealth across generations. By taxing transfers of wealth between generations it helps to level the playing field between people from families with different levels of wealth (Stantcheva, 2021). Stancheva further states that inheritance taxes are very unpopular, but due to misunderstandings of how they work and who bears them. She argues that it is possible with an exemption threshold relatively high, the middle class can be truly exempt, and very wealthy families can be taxed. Furthermore, she states that it is feasible to allow for some preferential treatment of transfers based on the closeness of the family link between the donor and the heir.

Apart from the taxes on wealth, most countries have a regressive tax system on consumption, where taxes are paid proportional to consumption (Blanchet, et al., 2020). Blanchet, et al. (2020) further state, that Scandinavian countries redistribute in general more than other Western European countries, which in return redistribute more than the US.

Transfers

On the other side of the tax system are benefits. There are several channels through which the collected taxes are redistributed to the population. One channel is unemployment insurance. Each country has a system to secure its citizens in case of a job loss. Other channels are pension insurances, health insurance, or long-term care insurance. Of these channels, health payments are said to be the most progressive transfers. The cash transfers reduce income dispersion. On average, the difference between market and disposable income is made up by three quarters due to transfers (Joumard, et al., 2012).

3.1.2 Pre-distributive policies

Inequality may be fought downstream or upstream, for instance, by equalising opportunities to access income-enhancing facilities. Next to redistributive policies, there are pre-distributive policies, whose policies alter household incomes indirectly by creating incentives and constraints for household behavior. On the pre-distribution side, there are several measures to improve and ensure equal opportunities to incur human capital for all citizens. These measures can provide a fair employment system, which allows all different socio-groups within a country to pursue a job that lets them live a decent life. This often means open access to income-enhancing facilities, for example, free education and training opportunities. Considering the skill-bias theories, which show that individuals with higher education earn more money, this is an important tool to curb inequality. While EU countries, in general, invest substantially in free public education, the quality across schools remains different. This may result in disadvantages for children from lower-income families or minorities (Stantcheva, 2021). Another type of pre-distributive policy is labour market reforms, like minimum wages and corporate governance regulations. A key factor to curb inequality is to ensure employment and guarantee that the minimum income is sufficient to sustain a basic expenditure. There are different schemes to curb unemployment.

Regarding the labour market, there are policies such as minimum wages, short-term schemes, and unemployment schemes that help the unemployed to reintegrate into the labour market. Considering the wage gap between women and men, regulations can be a remedy. Ensuring equal pay and opportunities for men and women is essential here, especially regarding the trends of more single-household families. Quotas are a further possible instrument to counteract inequality on this level. Quotas would help to bring citizens into jobs and to alleviate prejudices. On the European level, there is to mention the European Pillar of Social Rights which sets out core principles that would lead towards more ‘egalitarian institutions’ within the Member States. Another channel through which policies may indirectly remedy inequality is market regulation. For example, in the transport logistics market, with market regulations, the working conditions of the truck drivers can be improved and the labour market for truck drivers becomes fairer. Like in many industries globalization has driven down salaries, as workers from countries' supply surpassed demand and workers from countries with lower salaries accepted lower wages, driving down wages generally in the markets.

Effectiveness

Given the different policies and different levels of inequality across Europe and Anglo-Saxon countries, the question about the effectiveness of policies arises. For instance, shown the previous analysis that despite rising income disparities since the 1980s, inequality in Europe remains lower than in the United States. This suggests that European social models have been more successful than the US in addressing the challenges posed by technological change or globalisation. Different research has assessed the question about the effects of economic policies on inequality: “Can government intervention effectively reduce inequality?”

For instance Doerrenberg and Peichl (2014) discuss that the indirect effects on the progressive taxes or social benefits might yield an opposite effect and could eventually over-compensate the initial positive effect. They

argue that these redistributive policies might reduce incentives to work or to invest. However, they analyse the effect of three variables on inequality, measured by the Gini Coefficient. These variables are government spending (on fiscal levels), total public expenditure, and the degree of progressivity. They find that within-country variation in the expenditure can explain the varying levels of inequality. However, progressivity taxation appears to be less effective. They conclude that redistribution measures of government expenditure can result in less inequality. The estimated correlation here is with a 1% increase in government spending or social expenditure inequality decreases by 0.3% or 0.2% respectively. The relation is a lot weaker and less significant than considering tax progressivity. They further state that recent empirical evidence shows that higher tax progressivity triggers behavioral effects which tend to increase pre-tax inequality. One concern here is that in restoring incomes at the bottom, it becomes a key challenge for policy makers to facilitate and encourage employment and earnings growth that benefits low-income groups in particular. This concludes with a statement from the OECD (2011), which states, that even though tax-benefit systems have become more redistributive over the past 20-25 years, this did not stop income inequality from rising. This can be seen in terms of the Gini Coefficient or that market-income inequality grew by roughly twice as much as the redistribution did. Regarding the three groups I chose for my analysis it

4. The outbreak of Covid-19

4.1 What kind of shock was Covid-19?

With the outbreak of Covid-19, the world has been turned upside down and the crisis is said to be exacerbating existing inequalities (Stantcheva, 2021). So what happened with the outbreak of Covid-19 and how did the changes affect inequality? With the outbreak of the Covid-19 pandemic at the beginning of 2020 the world started facing a big aggregate shock on labour and demand markets. The major policies adopted to slow down the spread of the disease are lockdowns, travel restrictions, and curfews. These policies' ultimate aim is to save lives and prevent health systems from being overwhelmed. Nations went in lockdowns to stop the chains of infections leading the economy to a standstill. In many countries restaurants and schools were closed, events have been canceled, shops had to close and employees went into home-office. As shops and restaurants had to stay closed, tourism stopped, and as events were canceled many people were suddenly without work or facing serious challenges to continue their business, whilst others were flooded with work.

The policies of social distancing, aimed to save lives, brought with it many restrictions leading to higher unemployment or a reduction in income. In most developed countries governments took on large amounts of debt to reimburse their citizens and to prevent unemployment and poverty to rise. Without governmental support, the pandemic would have increased income inequalities, hitting harder the bottom of the income distribution (Stantcheva, 2021). Adams-Prassl *et al.* (Adams-Prassl, 2020) show that the pandemic in March and April 2020 had a negative impact on labour-force participation (LFP) and working time: these effects are stronger in the UK and the US than in Germany, and, within countries, hit less-educated workers and women

harder, so exacerbating pre-existing inequality. It can be said that the households with the lowest liquidity may not be able to survive for long without financial help (Mihailov, 2020).

Regarding the macroeconomic effects of Covid-19 Ludvigson, et al. (2020) modeled the costs of previous disasters to estimate the effect of Covid-19. They state that the outbreak of Covid-19 has significantly disrupted the economy. To understand the amplitude of the outbreak of Covid-19 it is helpful to understand the pandemic to be like a global natural disaster that functions as an exogenous shock. A big difference though in comparison to conventional natural disaster shock is that the Covid-19 shock is a multi-period event. They describe the shock to be simultaneously disrupting supply, demand, and productivity channels and that almost perfectly synchronized within and across countries. They further state that the implications of this shock on the economy, society, and health are drastic, not just for the foreseeable few weeks, but for a long time of period (Ludvigson , et al., 2020). On their assumptions of the shock imposed by Covid-19 to be an exogenous, multi-period constraint, they use a vector autoregression (VAR) which includes a variable for costly disaster series, a measure of uncertainty, and a variable of real activity. For their variables, they use monthly data from January 1980 to February 2020 of the United States. Overall, they forecast that the shock will lead to a cumulative loss in industrial production of 20% and in service sector employment of nearly 39% or 55 million jobs over the next 12 months (for the United States).

Barrero, et al. (2021) state that the Covid-19 shock and its policy responses have generated massive shifts in demand across business and industries. They provide evidence that effects of these shifts for the US economy, based on data from summer 2020 are re-allocative. The report shows three pieces of evidence for the persistent re-allocative effects of the Covid-19 shock. The first evidence is the sharp rise of the rates of excess job and sales reallocation over 24 months since the pandemic. This holds especially for sales. The second evidence are firm-level forecasts of sales revenue growth. For the next year, these forecasts imply a continuation of recent changes. It indicates that firms hit most negatively during the pandemic expect (on average) to continue shrinking in 2021, meanwhile, firms hit positively during the pandemic are expected to continue growing. The third evidence is based on employment trends. Covid-19 shifted relative employment growth trends in favor of industries with a high capacity of employees to work from home. The results by Barrero, et al. (2021) generally suggest that Covid-19 is a persistent reallocation shock. They describe this shock on two levels. One on the firm-level outcomes, indicated by forecasts to continue to show high rates of (expected) reallocation, and the other given the firm-level forecasts as of December. They summarize that the pandemic has reinforced firm-level trends that were already underway before the pandemic. This implies the pandemic to be a catalyst for pre-pandemic trends.

To summarize the previous section, the Covid-19 pandemic triggered a global aggregate shock. In other words: Covid-19 and its policy responses disrupted the economy, comparable to a global natural disaster as a multi-period event. The exogenous shock has an impact on supply, demand, and productivity channels and is said to have led to massive shifs in demand. In addition to that, the crisis has a negative impact on the labour force participation and on the working time.

4.2 Policy responses to Covid-19

4.2.1 General overview

National authorities enacted different measures and policies to contain the spread of Covid-19. As described in the previous section, most countries went into lockdowns by closing down schools, public facilities and demanding people to stay home. In other words, to curb the spread of Covid-19 the economy was set to stand still. To counteract the negative effects of the protectionist measures against the virus, countries enacted temporary measures to prevent the economcy to collapse. With the advance of the pandemic, countries further implemented stimilus policies in order to remedy the drop in GDP and curb GDP growth again. Generally speaking, all Member States of the European Union and the Ango-Saxon countries implemented labour and social policies with the purpose to limit the loss of income and preventing workers from losing their jobs. In the following, , I will describe in more detail the policies which have been implemented by making use of the policy tracker from the IMF. The policy tracker summarizes the key economic responses governments took and are taking to limit the human and economic impact of the Covid-19 pandemic of 197 countries. Given the enormous amount of the policies and their extraordinary purpose, the fiscal packages bring along high potential to tackle ongoing issues. For instance the policies are to address climate change or long-term inequality concerns such as digitalization of schools, support for pupils, and more fair wages. Generally, the enacted policies concerning the Covid-19 pandemic are either designed to stop the spread of the virus or to mitigate the negative economic effects caused by the pandemic and the policies to curb the spread. Accordingly in this chapter I will depict the range of policies which were implemented in connection to the Covid-19 pandemic and then decribe in greater detail the policies given in the three groups of countries (Anglo-Saxon, Mediterranean and Northern / Central European countries). To get a better understanding of the situation and the fiscal policies I will present an overview and a descriptive analysis with the amount of fiscal policy spent and other data related to the pandemic. Finally, I will provide a literature review on the fiscal policies to develop a better idea of the significance and effects of the fiscal policies.

4.2.2 Policies to stop Covid-19 to spread

The most common measures to stop the virus from spreading were border closures, closure of schools and non-essential businesses, social distance requirements, the enforcement of mask-wearing, and a ban on public gatherings and events. Many countries went into lockdowns for months. The policies and measures to stop Covid-19 to spread lead to severe impacts on the economy, as social distancing impeded the economy from running normally.

4.3 Countermeasures to mitigate the economic effects of the Covid-19 shock

4.3.1 Overview Countermeasures

The most common measures to mitigate the economic effects are fiscal policy packages and monetary policies, which had the ultimate purpose of stabilising the economy and to preventing the economic system from

collapsing. Unlike the policies discussed previously, which are addressed to tackle existing inequalities, the countermeasures to mitigate the economic effects of the Covid-19 crisis are temporary measures not primarily designed to tackle inequality. Still, it should be noted, that some already existing automatic mechanisms also work throughout this crisis and automatically prevent inequality from skyrocking. Existing automatic mechanisms are more prevalent in European countries compared to Anglo-Saxons. Therefore Anglo-Saxon countries may need to enact more temporary measures. The most common fiscal policies were subsidiaries to workers' income and businesses, tax reductions, and investments into the health system.

Fiscal Policies:

1. Funds to strengthen the health care system and investments in R&D. Expenditure for hospitals, treatments, and medical supplies increased due to Covid-19.
2. Tax reductions and / or referrals. Due to the economic shock, many companies started to face liquidity constraints. With a reduction or referral in taxes, the companies had larger cushions to cover their fixed expenditures.
3. Policies to maintain employment. With the economic shock, many jobs were suddenly, at least temporarily, redundant and many companies were not able to pay their employees anymore, due to cutbacks in sales. Accordingly, fiscal policies were designed to maintain employment and support these employees financially.
4. Unemployment insurance where it has not been yet established (such as the USA and Canada), and more flexibility on their conditions in the European countries.
5. Public loan guarantees and liquidity support for firms. With these schemes, access to funds is ensured, where public guarantee schemes are probably more useful for corporations, and concessional.
6. In some countries, investment in climate protection, affordable housing, health, and digitalization, innovation and research, education and training.
7. A relaxation of capital requirements and permits for high-quality liquid assets below the minimum liquidity coverage ratio requirement.

Monetary Policies:

1. Liquidity support for banks.
2. Temporary ban on short-selling stocks.
3. Change of policy rate (interest rate).
4. Facilitation of swap lines and extension on maturity of FX operations.
5. Extension of bond buyback program.
6. Expansion of eligible collateral for Term Repo operations.
7. Reduction of counter-cyclical capital bank buffer and lower thresholds for stability buffers.
8. Bond and Security Purchase Programs.
9. Pandemic Emergency Longer-Term Refinancing Operations.

10. Payment breaks available for mortgages, personal and business loans for customers affected by COVID-19.
11. Extension of maturities of guranteed loans.

Euro Area

In the following, I will describe in more detail the measures in the Euro Area, as they hold for most of the selected countries. In the Euro Area, the first case of Covid-19 was reported on January 24, 2020, since then Covid-19 has spread across the European Union with a severe impact. Overall the real GDP contracted by 6.4 in the EU in 2020 (IMF, 2021). The European Commission adopted a strategy for managing the pandemic and coordinated the supply of effective vaccines which became available at the end of December 2020. For instance, the European Commission published a comprehensive economic policy in response to the Covid-19 pandemic in April 2020. The package of about €540 billion (4 percent of EU27 GDP) includes several measures. For once it allowed the European Stability Mechanism (ESM) to provide Pandemic Crisis Support to each euro area country to finance health-related spending. It then provided €25 billion in government guarantees to the European Investment Bank to support up to €200 billion to finance companies. Furthermore, the European Commission created a temporary loan-based instrument (SURE) supporting the Member States to protect the employment of up to €100 billion. Then on December 11 the EU Budget and Next Generation EU recovery fund were introduced [EU Budget and Next Generation EU Recovery fund].

Regarding the Monetary Policies, the European Central Bank took action to support liquidity and financing conditions to households, businesses, and banks. In March 2020 the ECB initiated the Pandemic Emergency Purchase Programme (PEPP), a temporary asset purchase program of private and public sector securities. The Governing Council decided to increase the initial €750 billion envelopes for the PEPP by €600 billion on 4 June 2020 and by €500 billion on 10 December, for a new total of €1,850 billion (ECB, 2021). In addition to the PEPP, the ECB decided to expand the range of the Corporate Sector Purchases Programme (CSPP) and to ease collateral standards. Some countries expanded their monetary policies in addition to the European policies. For example, Spain launched a new Institute for Credits (Instituto de Credito Oficial) which is especially on sustainability and digitization.

4.3.2 Description per group

The descriptions below are all based on the information provided by the IMF Policy Tracker, which were last updated on July 2, 2021.

Anglo-Saxon countries

The Anglo-Saxon countries (Canada, Ireland, the United Kingdom, and the United States of America) reacted rather similarly to the Covid-19 pandemic. All countries implemented immediate measures to contain the spread of the virus. These measures include nationwide lockdowns, travel restrictions, vaccination programs, mandatory mask-wearing, social distancing rules, and closures of schools and other public institutions. In all countries, these measures lead to a strong contraction of the economy. Therefore, to mitigate the effects of the virus-containing measures the countries introduced numerous counter-measures. Generally, these counter-

measures are either fiscal or monetary. Regarding the fiscal measures, all countries have implemented enormous fiscal packages to ensure basic living standards, strengthen the health system, and stimulate the economy. More specifically, countries have enacted packages to support the health system, provide direct support to households and firms, unemployment and job retention schemes, allowed for tax deferrals to ensure liquidity and implemented credit support and guarantee schemes. The United States for instance further provided funding for basic education and also Ireland invested in training, education, and skills development. On the monetary side of the policies, the states implemented measures to ensure liquidity and to smooth out the money market. These measures included bond-buying programs, a reduction of the bank rate, lending and term funding schemes, expansion of repos, supervisory and regulatory actions. Regarding monetary policies the European monetary policies apply in Ireland.

Mediterranean countries

Covid-19 in Mediterranean countries triggered, especially in the beginning very strong lockdown measures. Italy was the first European nation to implement a nationwide lockdown which was one of the strictest and remained enacted for months. Also, France and Spain had one of the strongest initial lockdowns in the European Union. Regarding the rest of the measures, they are quite similar to the rest of the Union and the Anglo-Saxon countries. The Mediterranean countries implemented measures to curb the spread of the virus which included, next to the lockdowns mandatory mask wearings, curfews, quarantine restrictions, and travel restrictions,

Especially for the Mediterranean countries, the outbreak of Covid-19 imposed a higher risk of a plunge of the GDP as the Mediterranean countries are more reliant on tourism. Just like the Anglo-Saxon countries, the Mediterranean countries adopted fiscal measures to mitigate the negative effects of Covid-19 and the measures to stop the virus from spreading. These measures also include as well budget support for health expenses, unemployment benefits, temporary subsidies for households affected by Covid-19 or for vulnerable individuals or selected individuals (as in France), tax and social security deferrals, loan guarantees, liquidity support for hard-hit businesses, VAT reductions, unemployment schemes. Spain even introduced a new minimum income scheme. The policies implemented in the Mediterranean countries appear to be designed to remedy the worst consequences feared by the pandemic, such as poverty and a collapse of the economy. However, the measures appear only to be short-term oriented and not designed for the long term. Compared to the Anglo-Saxon countries little, or none, of the measures are dedicated to education or employee training or other key issues which would improve the well-being of the society in the long term.

Northern / Central European countries

As in the previous two groups, the most common measures to mitigate the spread of the virus in the Northern / Central European countries were: border closures, closure of schools and non-essential businesses, social distance requirements, the enforcement of mask-wearing, and a ban on public gatherings. However, the measures were implemented more differently across the countries. Sweden for instance did not impose lockdowns in the initial period and Germany and Poland followed more loose lockdown rules, for example,

Germany only imposed night curfews towards the end of the third wave, in the second quarter of 2021. However, in Germany, the reopening was very conservative. And the Netherlands did not impose mandatory mask wearing for a long time.

Concerning the fiscal policies, the Northern / Central European countries have adopted measures in a large scale. Similar to the previous groups these measures include support of the health care system, short-term work and income protection schemes, credit guarantees, tax reductions or referrals, and subsidies for businesses.

It can be seen, that the long-term effects are more in focus compared to the other two groups. The budget plans are more directed towards a green, fair and responsible recovery. Accordingly, there is more focus on education and training, support for climate protection, digitalisation, and green and summer job programs. Generally, there is more focus on sectors that are worst hit by the pandemic, families with children, and more support for the domestic airlines.

4.3.3 Chart with decline in GDP, Fiscal policies implemenet, deaths, etc.

The data is based on the data provided through the IMF Policy tracker, which was last updated on July 2, 2021. The IMF Policy tracker summarizes the key economic responses governments are taking to limit the human and economic impact of the COVID-19 pandemic. It should be noted here that the policy tracker focuses on discreptionary actions and might not completely represent policies adopted by governments in response to COVID-19. Therefore, policies such as automatic insurance mechanisms and existing social safety nets, which vary in breadth and extent among countries might not be represented. This adds up to other caveats for the analysis. As follows, information on policy action differs widely across countries with respect to detail and specificity.

Overview Fiscal Policies and Effects of Covid-19

Country	Amount Fiscal Policies in Billion of domestic currency	% Fiscal Policies of GDP 2019	GDP Drop Covid 2020 (annual %)	Covid Deaths - cumulative total	Deaths - cumulative total per 100000 population
Austria	49,6 €	12,6%	-7%	10627	119.39
Canada	$435,2	19,7%	-5%	27170	71.99
Denmark	81,2 kr	3,4%	-3%	2614	44.89
France	247,5 €	11%	-8%	113652	174.74
Germany	346 €	10,3%	-5%	92686	111.45
Greece	38 €	22,2%	-8%	14223	132.7
Ireland	24,5 €	14%	3%	5155	103.84
Italy	182,4 €	11,6%	-9%	129955	217.89
Netherlands	68,7 €	5,6%	-4%	18073	103.82
Norway	131,3 kr	4,4%	-1%	829	15.44
Poland	0,95 €	4,3%	-3%	75433	198.73
Portugal			-8%	17866	173.53
Spain	85 €	7,4%	-11%	85393	180.41
Sweden	908 kr	18%	-3%	14703	142.37
United Kingdom	£280	12,9%	-10%	134261	197.77
United States	$4.635,30	22,1%	-3%	655172	197.94

Figure 10 - Overview Fiscal Policies and Key Numbers regarding the Covid-19 pandemic

In the above overview I set up a summary of findings regarding fiscal polcies, the development of GDP and the deaths from Covid-19. I display the amount of money spent on fiscal policies (in billion) related to the Covid-19 pandemic, given in domestic currency. In the next column, I present the percentage of fiscal policies of GDP 2019. In this way the scope of fiscal policies among the countries is easier to compare, as it elimates the different sizes and dimensions of GDP of the countries and consideres the different values of currencies are eliminated as well. To further understand the severness of the crisis, I display the GDP drop in 2020 due to the Covid-19 pandemic. The only country in the selection in which the GDP did not decrease in 2020 is

Ireland. Despite the economic impacts of the pandemic Ireland's GDP grew by 3.4 percent in 2020, which is said to be entirely a result of the growth in exports (Reddan, 2021). Norway for example, given the numbers, does not appear to be hit hard by the pandemic. The drop in GDP is with -1 percent considerately low and also the number of deaths remains with distance the lowest. Given the overview Italy appears to be hit the hardest, regarding the number of deaths. However, considering the economic impact the United Kingdom and Spain appear to be the hardest hit. When now looking again at the percentage of fiscal policies of GDP of 2019 there are many differences in the amount spent. Together with Greece, the United States have spent the most on fiscal policies in response to the Covid-19 crisis with about 22 percent of 2019 GDP. Given the available data, the countries with the lowest expenditures are Norway and Denmark. Logically, a country which was hit hard by the pandemic would also spend more to counteract the negative effects. A further analysis on the efficiency of the policies will follow in the next chapter.

4.4 Effects of Policies

4.4.1 Literature review on Fiscal Covid-19 Policies

In this section, I will take a closer look at the existing literature regarding the temporary emergency policies. A question here is, whether the pandemic leads to a change in policymaking, and if so, how does this change affect inequality. Generally speaking, it can be said that with the Covid-19 pandemic and its corresponding, temporary emergency policies, in some areas 'the ice' broke. The best example here is the Covid-Bonds introduced in the European Union. Before the pandemic, especially in Germany, countries were against issuing debt on a common European level. In the light of the pandemic, and probably combined with new winds in European politics, the Pandemic Emergency Purchase Programme (PEPP) was introduced. It is the first time, that the European Union has issued common debt and its introduction caused many controversies. Such an instrument was also discussed after the financial crisis of 2007. Other reforms took place in the labour market. The German labour market in particular turned out to be very flexible and unconditional support was issued to individuals and businesses to support them during the pandemic. The unconditionality of these support measures is something rather new. It was mainly motivated by the rush in time, however the long-term effects might be a positive step stone towards more equality.

Apart from the unintended effects of the policies on inequality, Francesco Saraceno (2021) further discusses the possible long-term changes in policymaking the Covid-19 crisis triggered. These could be beneficial to manage inequality in the long-run. He discusses the policy response to the Covid-19 crisis. He concludes that "The Covid-19 crisis has revived the economic policy debate in Europe". He describes an onset of changes in policymaking. This onset was with the suspension of the Stability and Growth Pact (SGP) in March 2020, which will remain suspended at least until 2022. The suspension of the Stability and Growth Pact implies for instance, that the Member States are allowed to take on more debt than with the Stability and Growth Pact. He further describes how the Commission addressed criticism put forward by independent economists regarding the Stability and Growth Pact. This criticism is based on the current framework and he summarises to be (a)

too cumbersome and difficult to enforce, (b) only allowing for curbing of deficits but not debt, (c) to be penalising public investment, because it is easier to reduce than current expenditure and (d) forcing procyclical deflationary policies. Generally, he states that the European Commission has acknowledged that Europe's framework of fiscal policy is a source of instability and not of stability. As he describes a change in policy paradigm, he notes the move towards a new fiscal framework that focuses on the sustainability of public finances. One possible way to achieve this would be to exclude investment from the deficit calculation, named as the old idea of a golden rule of public finance. Saraceno (2021) concludes that European tools to manage the Covid-19 crisis could lead to a very different organisation of European macroeconomic policies. Stating that the focus is now set on interdependence and risk-sharing instruments in areas such as health, public investment, ecological transition, and the management of asymmetric shocks.

All Member States of the European Union implemented labour and social policies to limit the loss of income caused by the pandemic and to prevent workers from losing their jobs. The simulation of these temporary policies, via Euromod (Eurostat, 2021), include actions such as wage compensation schemes, transfers from government to firms and households, limp-sum benefits, reduction in or exemption from taxes. Clearly, the compensations to remedy the effects of the Covid-19 pandemic were considerably broad. Governments took unprecedented action to provide policy support for employment and revenue. Decker, et al. (2021) further investigates this issue to assess the scale of the policy response. They did this by comparing the scope of the rescue policy packages the US government and the FED took for the pandemic with the means imposed during the Great Recession. They conclude that the scope of counter-measures for the Covid-19 crisis was substantially broader than the policy during the Great Recession. Another early estimation from Eurostat (Eurostat, 2021) shows the compensation share of total losses by quintile and main components in a year-on-year change. They reveal the extent to which the losses in income from work have been alleviated due to the short-term schemes implemented across the European Union to protect the labour market. In their estimation, they take into account two major policy tools which were introduced to stabilise income. These are monetary compensation for reduced working hours or lay-offs and reduced taxes. The overall compensation share ranges between 70 and 85 percent. The analysis shows that the compensation benefits follow a progressive distribution, which is higher for lower incomes.

5. Economic and social impact of the Covid-19 crisis

In the following chapter, I will discuss recent literature and early estimates on how the Covid-19 pandemic influenced inequality. I will further set a focus on the role of the economic policies governments implemented to remedy the negative effects of the Covid-19 shock. I will discuss whether these policies helped to counteract existing trends in inequality and generally their effect on inequality. Therefore, I will start with a literature review on this issue and continue with an analysis. In the analysis I will present the scope of the fiscal policies

given by the change in GDP from 2019 to 2020, I will display the evolution of GDP per capita and gross disposable income per capita and conduct a regression to estimate the effects of the policies on inequality.

5.1 Literature review

In the previous sections, I discussed the exogenous shock Covid-19 imposed on the economy and already discussed possible consequences for the population. The demand shock imposed by the crisis led many companies to problems remaining profitable or even to cover their costs and some had to stay closed and lay off workers. When thinking about inequality, this is a big factor that could increase existing inequalities and could bring individuals closer to being at risk of poverty. In the following, I will discuss some research regarding the impact of the Covid-19 crisis on household income and inequality. Generally thinking, exogenous shock caused by Covid-19 could have three different possibilities to influence inequality. The first possibility is that the shock could increase inequality. An increase in inequality would imply that poor households are affected harder by the pandemic, or that wealthier households benefit a lot from the pandemic or both. The next possibility is that the pandemic does not affect inequality. It would mean that all shares of the income distribution are affected equally by the pandemic. Possible job losses would hit all quintiles of the income distribution proportionately equally. The third possibility is that income inequality decreases. This would happen if wealthier households would incur relatively higher income losses than the households with lower income. Or households with lower income would benefit unproportionately more than the other income classes. On the next level, the policy responses have to be considered. The possible policy responses can reverse, reinforce or not affect all of these three possible trends. According to these possibilities, I will discuss in the next section what recent research has shown about the effect of inequality on household income caused by the Covid-19 crisis.

One of the main economic impacts of the Covid-19 crisis is the impact on employment income. The Covid-19 crisis led to an increase in unemployment or a reduction of working hours in certain sectors, which were affected by the pandemic. The increase in unemployment or reduction in working hours was caused by sudden social-distancing measures, which caused closures of all non-necessary commercial facilities or sent people into home-office. In a second instance, due to the closures and the economic uncertainty in the society, demand decreased and led companies to lay off their employees. Therefore all citizens who worked in sectors affected by the pandemic or who were not eligible for home-office were facing serious issues to generate their employment income. Given the circumstances, unemployment increased more slowly and to a lesser extent. This is due to the high take-up rate of job retention schemes and transitions into inactivity (Almeida, et al. 2021)

5.1.1 Initial development

In the following section, I will discuss research, estimations, and analysis on the early stages of the pandemic. The research generally indicates that inequality decreased as a consequence of the enormous fiscal packages. However, the early findings, are limited to the first months of the pandemic and do not allow to make

conclusions for the long run. To start with, I will display a research that analysed the financial vulnerability of households in the European Union. Midões and Seré (2021) analysed different European countries on how living with reduced income would affect them. Given the exogenous shock caused by the pandemic, it may be of importance to determine whether and for how long households can withstand a certain income shock for a defined period. Midões and Seré (2021) analyse households' pre-existing vulnerabilities to an income shock. This allows them to assess the financial vulnerability employees have in different European. Financial vulnerability is defined as the likelihood that an economic shock will result in a substantial decline in individual well-being. Using an objective approach, they estimate the financial vulnerability by testing whether households could cover their usual basic expenditures under a hypothetical shock. More precisely, they test the ability to cover basic expenditures when private income, income from employment, falls away. The results show a high degree of financial vulnerability across Austria, Belgium, Finland, France, Germany, Italy, and Portugal. This indicates that without their privately earned income, 18,2 million individuals, or 7% of the population considered, would not be able to cover one month of basic expenditure (food and utilities). Considering the time horizon of three months estimated 31,2 million individuals, or 12.8% of their population, are financially vulnerable. This research already indicates how many households would enter a serious situation of financial difficulties if their incomes would fall away in case of an exogenous shock and demonstrate the need for an employment protection scheme, which would support these households in times of a crisis.

Other researchers investigated more specifically the impact of Covid-19 on income inequality. Their results suggest that during the first months of the pandemic, households' income inequality has either decreased or remained relatively constant. This is shown for example by Brewer and Gardiner (2020) who study how the crisis is affecting or is likely to affect, household incomes focusing in particular on low-income households. They use surveys of working-age adults to estimate the impact of Covid-19 on income inequality. Their results suggest that the probability of reporting lower household income is relatively constant across pre-Covid-19 income quintiles. This result is mainly due to the success of the (strengthened) social security safety net in cushioning the blow and partly because many at the bottom of the income distribution are unaffected by job loss. In another approach, Almeida et al. (2020), investigate the cushioning effect of fiscal policy measures during the first covid-lockdown on households' income. Using the EUROMOD they analyse the effect of the pandemic and the policy responses in 27 European countries are simulated. The EUROMOD is a microsimulation model for the EU, to compute the impact of aggregate GDP and employment changes on households' incomes (Almeida, et al., 2020). It shows the Covid-19 crisis would have increased the relative Gini Coefficient 2020 by 3.6 points, but given the policy response, the Gini Coefficient will reduce relative inequality by 0.7 points. .

A research by Clark, et al. (2020) makes use of a survey that offers unique high-frequency information on household disposable income. The authors used data from a panel survey from the COME-HERE (Covid-19, Mental Health, Resilience and Self-Regulation). This survey allowed them to track income in five European

countries, France, Germany, Italy, Spain, and Sweden. They compare pre-Covid-19 observations as of January 2020 with obervations in September 2020. Their picture therefore depicts just the middle of the pandemic, at the onset of the second wave of infections. Clark, et al. (2020) find a fall in income inequality during Covid-19 in the five European countries. The countries they chose for their analysis are, at the point of analysis, not comparable regarding the spread of Covid-19 and policies implemented. With Italy, the European country first to introduce a nationwide lockdown, and Sweden, which never had a lockdown, they choose two rather extreme examples. They find that: "relative inequality in most of the five countries fell between January and September 2020: a by-product of government compensation schemes has been to reduce relative inequality." The exception is France where relative inequality increased slightly. The results show that inequality decreased in Germany, already in May. They find that absolute inequality fell over the period January to September 2020, stating that as such policy responses may have been more beneficial for the poorer than the richer. Raising again the question of whether inequality is rather a choice of ideology or a failure of the system? As they state in their paper, the lower inequality may result in the bottom of the income distribution, which was potentially the most affected by the pandemic. They further analysed inequalities regarding subgroups. Given their early results they did not find any change, which is contradicting with previous literature. One might well notice here, that the time horizon of the survey is very short and happened throughout two quite diverse periods of the pandemic. The initial lockdown and the consecutive, relatively, free summer. Furthermore, the survey spots exactly two trends, an initial increase in inequality, which is reversed by government policies by the end of September. Yet the analysis does not allow to deduce that inequality decreases because of the policies which have been taken as a response to lockdowns because the total effect of the pandemic is yet not foreseeable. This analysis only portrays the happenings related to the first wave. Considering the period of composition of this thesis, we are in the middle of the third wave or maybe even the fourth wave, so an update might be needed here. Despite the limitations, the papers give considerable evidence that the pandemic can also be a chance to implement measurements that remedy the trend of increasing inequality.

5.1.2 Long-term development

In the following section, I will further discuss the possible implications of the Covid-19 crisis on inequality in the long term. Therefore I will display research on how the pandemic affects income and why this could have significant long-term effects. Generally, research shows, that certain income groups are affected differently and especially in a different proportion than others. The unproportionate effects of the pandemic on certain groups would enforce inequality to rise. The previous researches show that income inequality did not increase but rather decreased as a result of the Covid-19 pandemic. This, however, is rooted in the strong policy response which was implemented by European countries, as discussed above. Their results are conform with the conclusion of Midões & Seré (2021) from a research about living with reduced income. In their research, they highlight the need for income support even for short-term shocks and suggest that the COVID-19 employment protection schemes awarded are extremely effective in reducing the number of vulnerable individuals. Here, they also find differences across countries. These differences suggest that Employment

protection schemes are extremely effective in decreasing these numbers, particularly in Italy. They give two reasons for these differences. First, in Austria and France, there are fewer individuals who have to receive the scheme compared to Portugal. Second, the pre-existing savings are on different initial levels. More prudent individuals, with higher initial savings, are more resilient to an income shock.

A research by Stantcheva (2021) depicts a more complete answer to the suspected trend of decreasing inequality due to the Covid-19 crisis. Stantcheva reviews the evidence to date on how long-standing fractures have been put into sharp relief by the pandemic and discusses policies to address them in her paper "Inequalities in Times of a Pandemic". In her paper, she states that the Covid-19 pandemic has exacerbated existing inequalities and that without governmental support, the pandemic would have increased income inequalities, hitting harder the bottom of the income distribution. As some studies show, for instance, Clark et al. (2020) also discussed above, income inquality is declining during the pandemic. However Stantcheva states that this trend may be misleading. This is because the decrease relies on short-term policy responses to the outbreak of the pandemic. Recent results from early estimation on income inequalities in the European Union confirm the trends described by Stanctcheva. Estimations by Eurostat (Eurostat, 2021) show that as a consequence of Covid lockdowns income inequality increases within and between European Countries. The estimations published by Eurostat modeled the impact of the labour market evolution on employment income and the effect of social protection schemes enacted by national governments. The estimated income inequality and poverty index are given in the yearly change from 2019 to 2020. It should be noted that the results presented are particularly highly uncertain.

Effects of the pandemic on different income groups

Taking into consideration, that the positive effects of the fiscal policies on inequality might only be temporary, I want to investigate further the possible long-term implications of the pandemic on inequality. The following research suggests, that certain income groups are affected unproportionately by the pandemic. These unproportionate effects could lead to an increase in inequality in the long run. Stantcheva (2021) shows how inequality would have evolved if no measures would have been taken. Reasons for the increase of inequality through pandemics are seen because of remote work requirements employment loss, which rather affects low-income workers. Remote work opportunities are unevenly distributed across the income distribution. Lower-income employees have lower potential and fewer opportunities for remote work. The unequal potential for remote work thus is likely to reinforce existing inequalities. It can be seen that wage premia for working from home are higher for workers who already earn more. This increase of inequality through remote work may also become a driver for regional inequalities, (as remote work is more likely to be done by employees living in cities than in the countryside). Another reason for increasing inequality Stantcheva gives the employment loss. Stating that, during the pandemic lower-income workers who are either working in "essential" occupations or work in fields with lower potential for remote work or which were more exposed to adverse labour demand shocks. A study in the U.K. shows that the likelihood of being laid off or furloughed falls with

higher earnings and wealth. Less-educated workers or those under 25 or older than 65 have also faced substantial disruption (Spittal & Piyapromdee, 2020).

The estimations by Eurostat (Eurostat, 2021) indicate that income inequality increases within and between European Countries as a consequence of the Covid-19 crisis. They further analysed different subjects like the median employment income vs. disposable income for the working-age, the median income by Member State, the median employment income vs. median disposable income in the EU, the compensation share of total losses by quintile and main components, the year on year changes by subgroups and finally at-risk-of-poverty indicators. The results provide insights into how the pandemic affected the population. For instance, the estimations about the median employment income vs. disposable income for the ages 16-64, show that the median employment income decreases by -7.2%, but disposable income remains stable for the working age. The disposable income includes extraordinary transfers and taxes as a consequence of the temporary policies implemented on the national levels to cope with the Covid-19 crisis. This shows that employment income is affected substantially by the pandemic and indicates the extent of policies for the stabilisation of wages and household income. The analysis of the median income by member states provides further insights on how member states develop in comparison. The results suggest three different developments. In about half the Member States the estimates show an increase of the median income, in four Member States (Cyprus, Italy, Belgium and Greece) the median income is estimated to decrease, and in the remaining Member States median income is estimated to remain stable. In another analysis, they compared median employment income vs. median disposable income in the European Union. This analysis provides a more in-depth insight into the effect of Covid on inequality, based on the evolution of (median) employment income against the equalised disposable income. The results show that the lower-income households were affected most by the crisis but also received higher benefits. It further suggests that the median disposable income increased progressively towards the left part of the income distribution. This indicates that the pandemic rather affects households with low income, thus would, in the absence of counter policies, increase inequality.

To display the general development of the Covid-19 crisis regarding inequality Filauro and Fischer (2021) have analysed income inequality between all citizens across individual member states of the European Union. They find, that: income inequality among EU citizens is significantly lower than among US citizens but slightly higher than in countries with established welfare models such as Australia and Japan. They used the Theil index and a Mean Logarithmic deviation of disposable incomes to display the evolution of between-country inequality in the EU and the euro area. Their analysis shows that the between-country inequality absolute trend has been declining since 2007. They argue that this convergence comes from the enlargement of the European Union 1993 (EU12) and from stagnating (or even declining) average incomes in southern member states. They conclude that to tackle income inequality in the EU, within-country inequality should be addressed. However, they state that the short-term outlook for EU inequality is rather grim. As a consequence of the Covid lockdowns, between-country inequality is on the rise as the impact on employment incomes is

proportionately affecting relatively poorer European countries. With that statement, they complement the previous findings and indicate that there has been a change in inequality.

This section shows that initially, the outbreak of Covid-19 and the corresponding policies led to a decrease in inequality. However, research also points out financial vulnerability and the need for policy intervention to cushion the negative effects of the Covid-19 measures. It further indicates that Covid-19 reinforced preexisting trends in inequality. Estimations show that lower-income households were more affected by the crisis but still received higher benefits. Despite the initial decrease in inequality, inequality is said to rise given two reasons. First, because remote work opportunities are unevenly distributed across the income distribution and secondly the observed difference in wage premia. As it can be seen that wage premia is higher for workers who already earn more. This concludes with the theory of the skill bias of the already existing trends in inequality. Finally, early estimates show disposable income remained stable despite a decrease in employment income by -7.2%. From this section one can conclude that if these estimations should remain true, the development of inequality caused by the pandemic coincides with many theories regarding inequality and the Covid-19 crisis. This would mean that the households with lower income are hit harder by the Covid-19 crisis and are more exposed to risks described in the section of the main drivers of inequality, like climate change. However, these results also suggest a possible change in policymaking, for instance with the relatively higher compensation benefits for households with lower income. These changes in policies would be in favor of the households with lower income and ultimately reverse trends of increasing inequality.
The general notion from this chapter shows that Covid-19 and the restrictions implemented to curb the spread of the virus affected the employment income of the lower-income employees relatively harder than the employees with higher income. Other groups which are hit unproportionately stronger are young people and groups with migration background. The unequal effects of the pandemic on certain income groups would lead to an increase of inequality, to a disadvantage of the poorer parts of the population. Yet, the previous section also shows that fiscal policies, to remedy the negative effects of the Covid-19 restrictions, were effective in preventing income inequality to rise, at least in the short run, and have ensured a rather stable level of households income among Europeans.

5.2 Analysis

In the previous parts, I discussed the main drivers of inequality, thus through which channels inequality might be affected and how the Covid-19 crisis influences inequality. In the following, I will analyse the effects of the fiscal policies introduced temporarily by the governments as a response to the Covid-19 pandemic on inequality. I want to investigate whether the policies had an impact on inequality. Accordingly, I will further discuss the hypothesis, that fiscal policies lead to a decrease in inequality. Therefore, I will compare the scope of fiscal policies spent during the Covid-19 pandemic, compared to the drop in GDP. In the next step, I will display the evolution of GDP per capita versus disposable household income. The comparison might reveal if

the fiscal policies spent helped to stabilize household income, in general. Finally, I will conduct a regression to the effects of government policies on inequality, controlling for the severity of Covid-19.

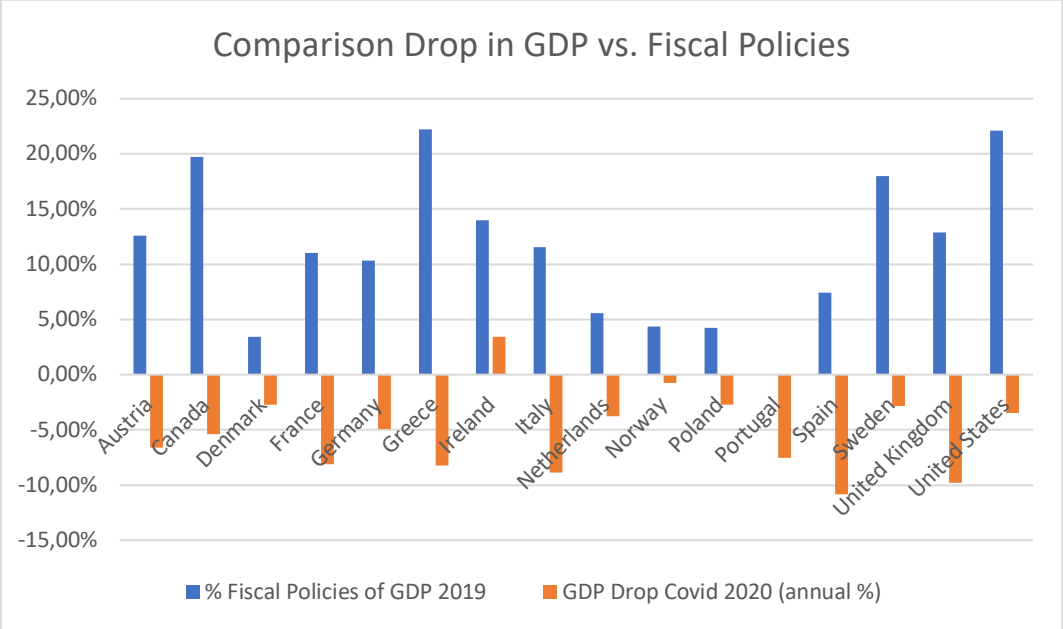


Figure 11 - Comparison Fiscal Policies vs. Drop in GDP (Analysis based on Data from the IMF Policy Tracker)

5.2.1 Comparison Fiscal Polcies vs. drop in GDP

The above overview shows the dimension of the drop in GDP due to Covid-19 and the scope of fiscal policies spent in response to Covid-19, both indicated as a percentage of the GDP 2019. By expressing both as a percentage of GDP 2019 I can compare them, despite considerable obstacles. The percentage of fiscal policies represents the billions of money spent on fiscal policies related to Covid-19. By representing the scope of fiscal policies as a percentage of GDP I can eliminate the differences in currencies and the different sizes of the domestic economies. The overview reveals once, the differences in the drop in GDP. In the following, I will describe and compare the drop in GDP given the three groups, Anglo-Saxon, the Mediterranean, and Northern / Central European countries. For instance, the Northern / Central European countries appear to have had a lower drop in GDP. Accordingly, the drop in GDP remains below -5% for Denmark, the Netherlands, Norway, Poland, Sweden. But also in the United States. Moreover, Ireland did not write an annual drop in GDP growth due to the Covid-19 pandemic. This leads to a very diverse pattern in the group of the Anglo-Saxon countries, where the remaining two countries, Canada and the United Kingdom, recorded more severe drops in GDP growth due to the pandemic. The United Kingdom recorded a drop in GDP of almost 10%, which is the second strongest drop within the selected countries. Regarding the third group, the Mediterranean countries, the Covid-19 shock had on average a stronger economic impact than on the Northern / Central European countries in 2020. Reasons for this could be the unfortunate initial high levels of infections, for instance in Spain and Italy, followed by the very severe lockdowns and that these countries are more dependent on tourism. Overall, regarding the drop in GDP, there might be two patterns to identify. One pattern concerns the Mediterranean countries, which appear to be similarly strong affected by the Covid-19 shock. The other

pattern indicates that Northern / Central European countries were better off from the pandemic than the Mediterranean countries. This indicates that the Northern / Central European countries are economically more resilient to a strong external shock. Yet there are many more factors to consider before making a reliable statement.

Having identified that countries are hit differently by the crisis, one could assume that countries hit harder by the crisis also spent more to remedy the negative effects on GDP. Yet this graph indicates that the scope of the economic shock on the countries did not determine the scope of fiscal policies spent. Therefore I will examine the levels of fiscal policies for each group. Starting again with the Northern / Central European countries, the levels of fiscal policies vary from country to country and seem to be related to the economic shock through Covid-19. Accordingly, Denmark and Norway did not spend a high percentage of the previous year's GDP on fiscal policies but did also not experience a strong drop in GDP. Nevertheless, all counties have spent more on fiscal policies than the drop in GDP they recorded for 2020. Considering the Anglo-Saxon countries the diagram shows that these countries have all spent a considerable amount on fiscal policies and spent on average the most. The United States mobilised enormous sums and spend about ~22,1% of the 2019 GDP. The last group, the Mediterranean countries, appears to be in the middle range of the percentage of GDP spent on fiscal policies.

To conclude, the diagram does not reveal clear patterns, and also the hypotheses, that countries that are hit harder economically spend more on fiscal policies can be rejected. The descriptive analysis shows that the Anglo-Saxon countries spend in comparison more on fiscal policies than the other countries (measured in percentage of the 2019 GDP). The analysis further shows that economically the Mediterranean countries are hit the most by the virus, together with the United Kingdom.

5.2.2 Overview evolution GDP per capita and disposable income

Next, I want to compare the evolution of GDP per capita and disposable household income. The analysis might give further insights into how households are affected by the pandemic and the effectiveness of the fiscal policies. The available data, however, only provides insights on the average development. It leaves the question of how certain income groups, such as the bottom 50 percent of the income distribution, were affected. Unfortunately, the available data is not detailed enough, yet allow to conduct such an analysis for certain shares in the income distribution. However, the following analysis still allows getting first insights to estimate the effect of the fiscal policies and to get a broad overview. The data origins from the OECD household dashboard (https://stats.oecd.org/?datasetcode=hh_dash#). The data streams are indexed at 100 with the starting date Q1-2007.

Anglo-Saxon countries

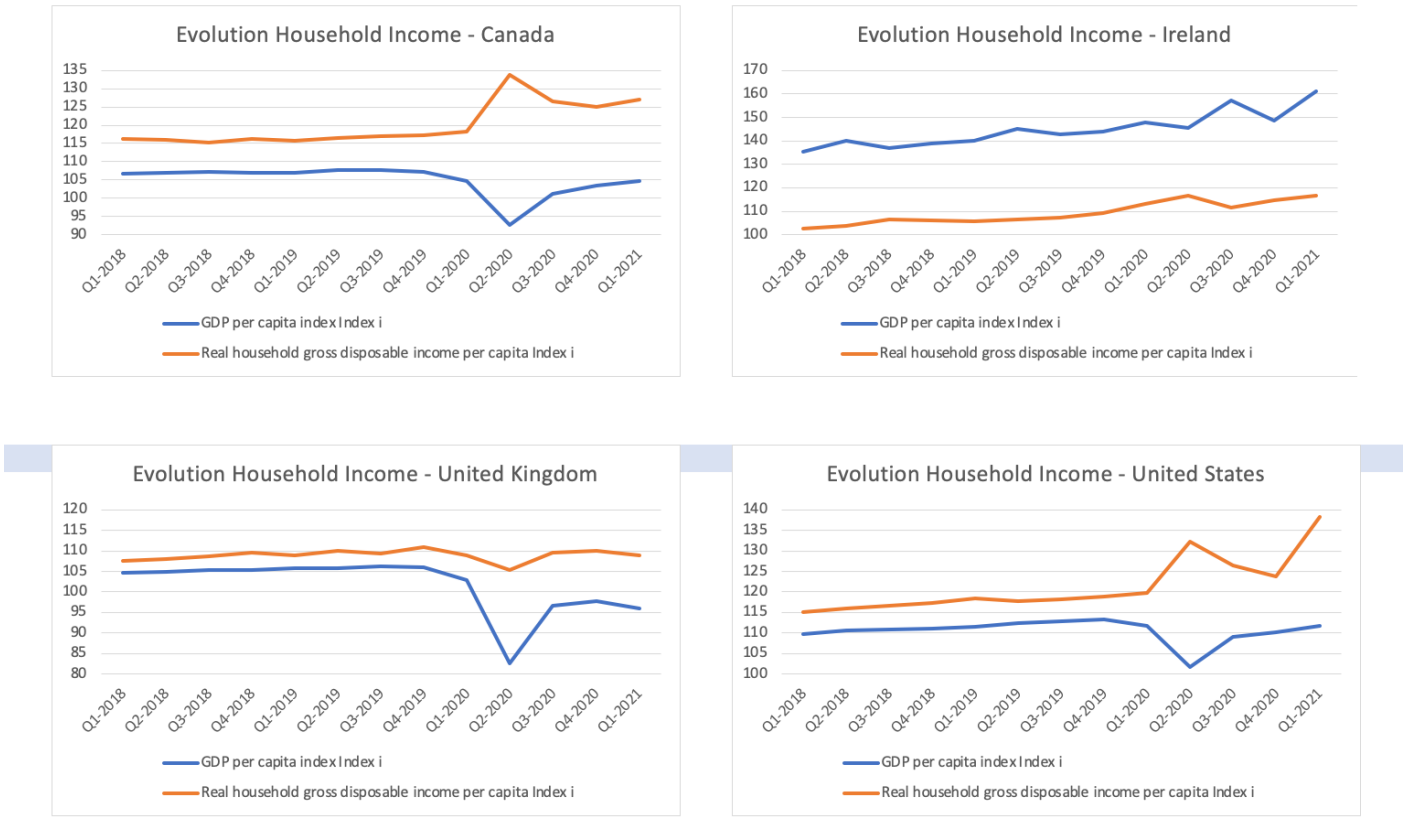


Figure 12 - Evolution Household Income Anglo-Saxon countries based on the OECD Household Dashbord

This overview shows that in the Anglo-Saxon, except for Ireland, countries' GDP per capita dropped reaching the lowest point at the beginning of the pandemic in Q2-2020. As already discussed above, Ireland did not suffer a drop in GDP in 2020. Accordingly, the GDP per capita does not decrease significantly.

Looking at the fiscal policies it can be seen, that on average a considerable drop in disposable income was prevented. In Canada and the United States, the disposable household income even rose during the period in which the GDP per capita dropped. This conforms with the results from the previous analysis which shows, that Canada and the United States are among the countries which spent the most on fiscal policies. Generally, this indicates that the policies to remedy the negative effects of the Covid-19 shock were efficient in the Anglo-Saxon countries. The dimension for inequality remains however unknown. Yet, one could assume that thanks to the enormous amounts of the fiscal policies, the negative Covid-19 shock did not increase inequality as much as it could have.

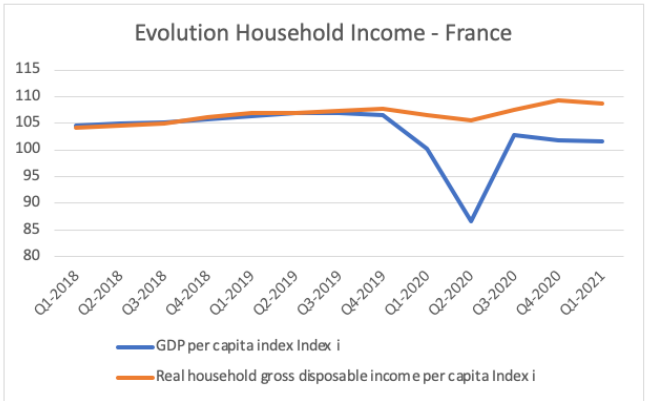
Northern / Central European countries

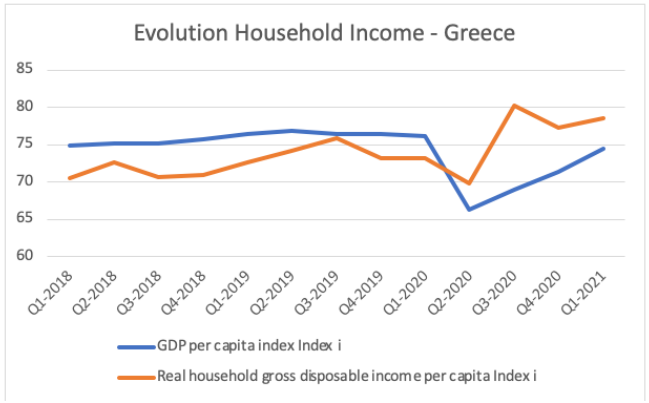
Figure 13 - Evolution Household Income Northern / Central European countries based on the OECD Household Dashbord

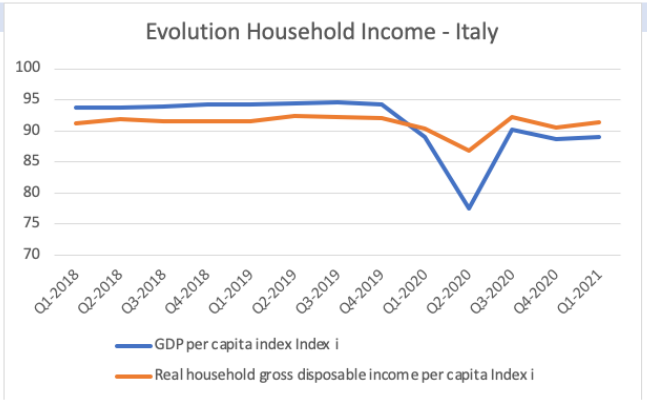
In this group the picture is a bit different. All countries suffered a drop in GDP per capita and disposable GDP per capita. However, overall the disposable income per capita appears to have decresed less, which implies that the fiscal policies have been efficient. Quite interestingly, the disposable household income in Poland rose during the period of decrease of the GDP per capital, reaching its highest level in Q3-2020. After that, with Q4-2020, the disposable income decreased again to a lower level, finally reaching the pre-pandemic level in

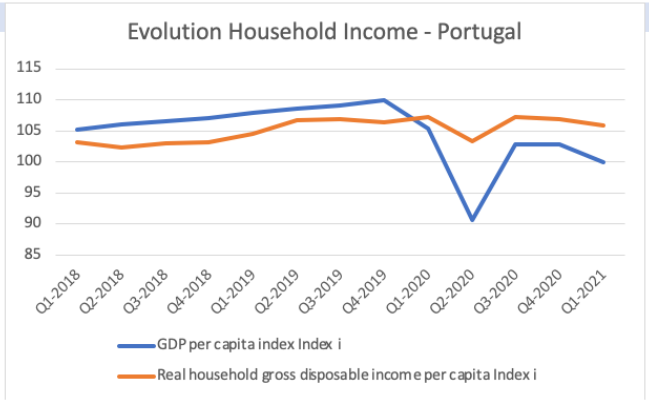
Q1-2021. The reason for the drop after Q3-2020 is that the Covid-19 fiscal policies stopped with the end of Q3-2020, after having been extended through Q3-2020 (IMF, 2021).

Mediterranean countries









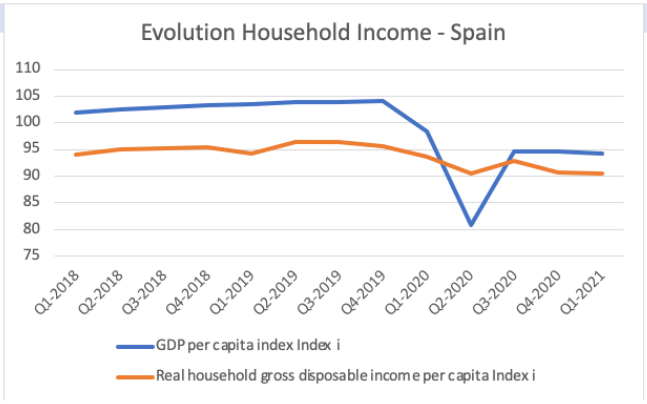


Figure 14 - Evolution Household Income Mediterranean countries based on the OECD Household Dashbord

The overview of the Mediterranean countries shows similar patterns as for the previous two groups. France, however, appears to have cushioned quite well the effects of the Covid-19 shock, as the disposable household income does not decrease a lot during the strongest drop of GDP per capita. In all other Mediterranean countries the pandemic disposable income per capita.

The previous analysis shows that the fiscal policies were efficient in the selected countries to cushion the negative effects of the Covid-19 shock. One could further interpret, that as the fiscal policies mitigated the

effects of the pandemic on household income, it also mitigated the impact on inequality. However, the data situation does not allow to make a reliable statement from this information. Unknown information about the distribution to subgroups remains. This leaves the question of whether certain sectors or income groups were more favored by the policies and if others were overlooked.

5.2.3 Change in Gini Coefficient

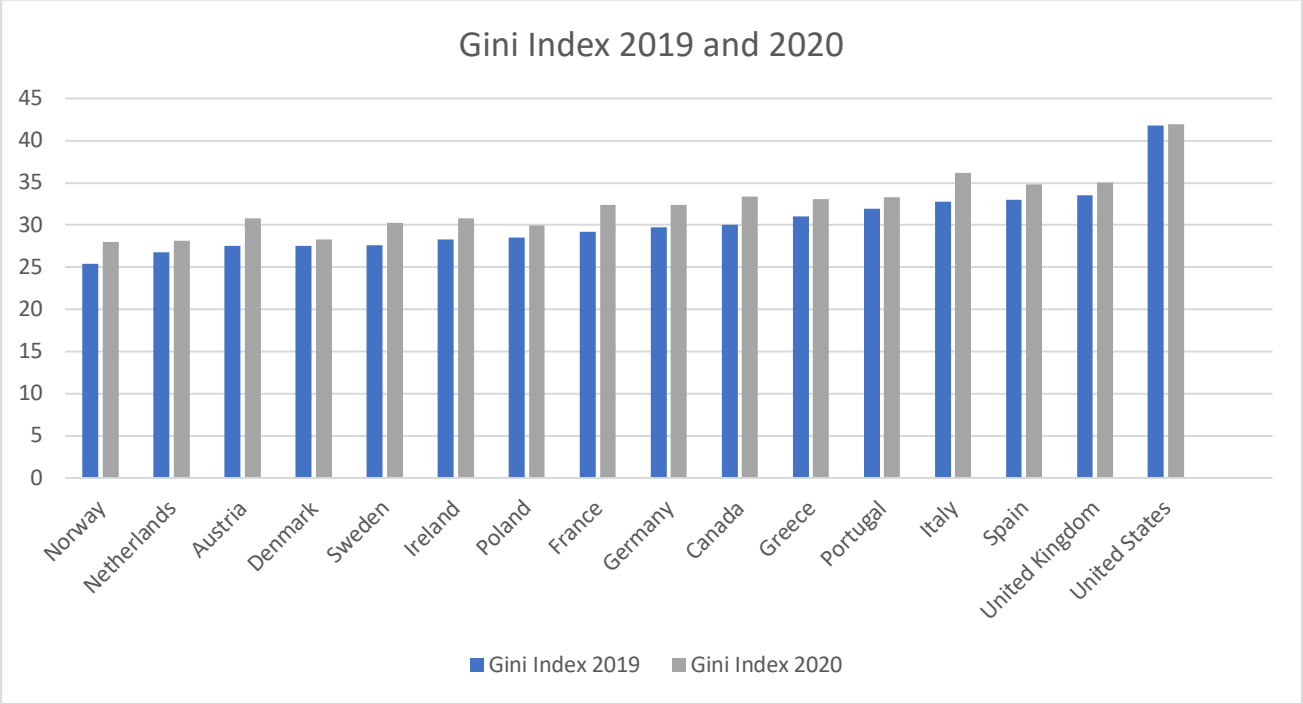


Figure 15 - Gini Coefficients 2019 vs. 2020, based on data from Statista

The above overview shows the Gini Index for 2019 and 2020 in the selected countries. The countries are ranked according to the level of the Gini Index in 2019. It can already be seen that the Gini Coefficient changed differently in each country. But generally, this overview shows the levels of the Gini Coefficients before and during the pandemic. The United States shows the highest level of inequality, with a Coefficient of 41,8 before and 41,95 during the pandemic. Due to the pandemic Italy, for example, would change its ranking and take on the second place after the United States with a Gini Coefficient in 2020 of 35,2.

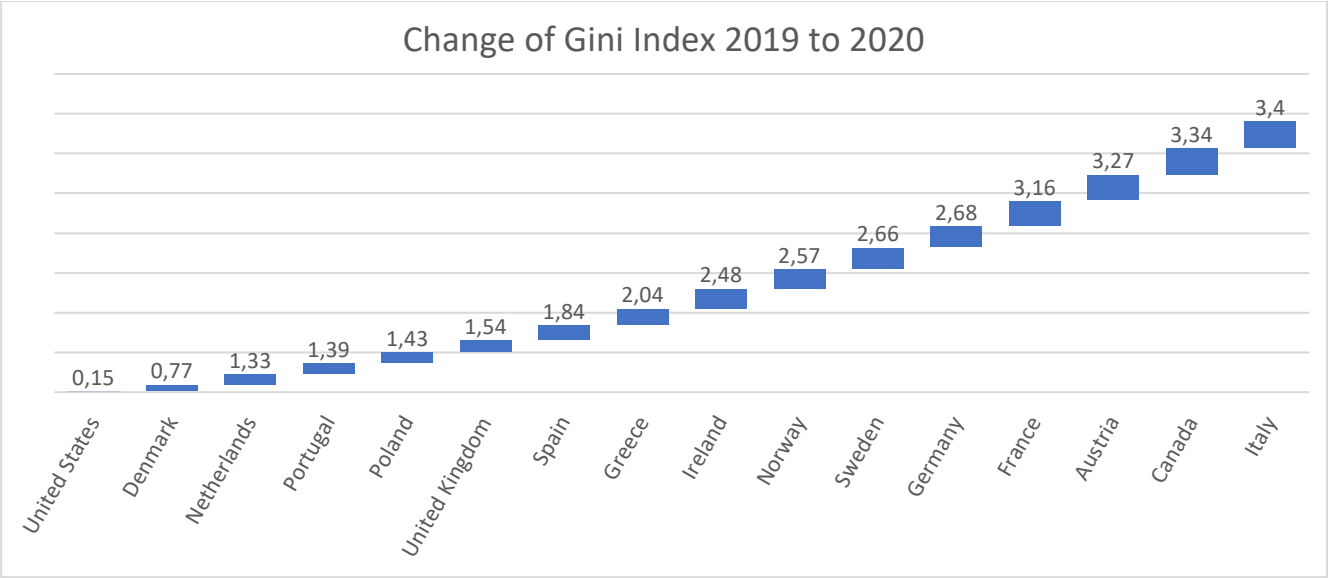


Figure 16 - Change of Gini Index 2020, based on data from Statista

The above graph indicates the change of the Gini Index from 2019 to 2020. The data is based on estimations from Statista (Degenhard, 2021). The forecast is based on a dataset composed by Statista's own surveys and datasets from international institutions (such as the IMF, the World Bank or the United Nations), national statistical offices, trade associations and from the trade press (Degenhard, 2021).

Generally, all observed countries appear to have had an increase in inequality in 2020. Yet, the increase remains quite diverse. The countries with the strongest increase appear to be Italy, Canada, and Austria. However, Austria remains at a much lower level of inequality, with a Gini Coefficient of 20,77 in 2020, than Canada and Italy (33,34 and 36,2). The overview further shows that the strongest, estimated, increase of the Gini Index due to the crisis was in Italy. This can be explained with the knowledge that Italy was one of the countries hit most by the pandemic and that in Italy pre-existing financial vulnerabilities have already been high. However regarding the drop in GDP and the number of deaths per 100.000 inhabitants the United Kingdom was similarly hit by the crisis, but its Gini Coefficient did not increase as much. These observations let assume that the reasons for the increase in inequality are others than simply the Covid-19 shock. The lowest increases appear to be in the United States, Denmark, and the Netherlands. This is an interesting observation because all countries have been affected differently by the pandemic in terms of the spread of the virus (deaths per 100.000 inhabitants) or drop in GDP. Regarding the spread of the virus, the United States have been affected the most, with ~200 deaths per 100.000 citizens, followed by the Netherlands with ~100 deaths per citizen and Denmark counted ~45 deaths per 100.000 citizens. Similarly however is the drop in GDP with between -3 and -4 percent. Regarding the number of fiscal policies spent, the United States has spent more than 4 times more than Denmark and the Netherlands. These observations raise again the question of which factors influence the change in inequality.

5.2.3 Effects of government policies on inequality

In the following chapter I will provide a regression to estimate the effects of government policies on inequality, controlling for severity of the Covid-19 shock. I want to test if the fiscal policies introduced as a consequence of the Covid-19 shock mitigate the increase in inequality, the shock would cause. This would mean that with the implemented policies inequality could decrease, independently of whether it was its purpose or not.

Therefore I set up following regression:

$$\Delta Gini\ Coefficient\ =\ \alpha\ +\ \beta_1 \cdot Fiscal\ Policies$$

My variable of interest, the change in Gini Coefficient is the vector of the change of Gini Coefficient from 2019 to 2020 for all selected countries. My regressor in this model is an indicator of the scope of fiscal policies. This is given by the scope of fiscal policies as a percentage of the GDP 2019 of each country.

```
Linear regression model:
    y ~ 1 + x1

Estimated Coefficients:
                   Estimate      SE        tStat      pValue
                   ________    _______    _______    _________

    (Intercept)      1.9622     0.57529     3.4108    0.0046449
    x1               1.7992      4.2802    0.42036      0.68109
```

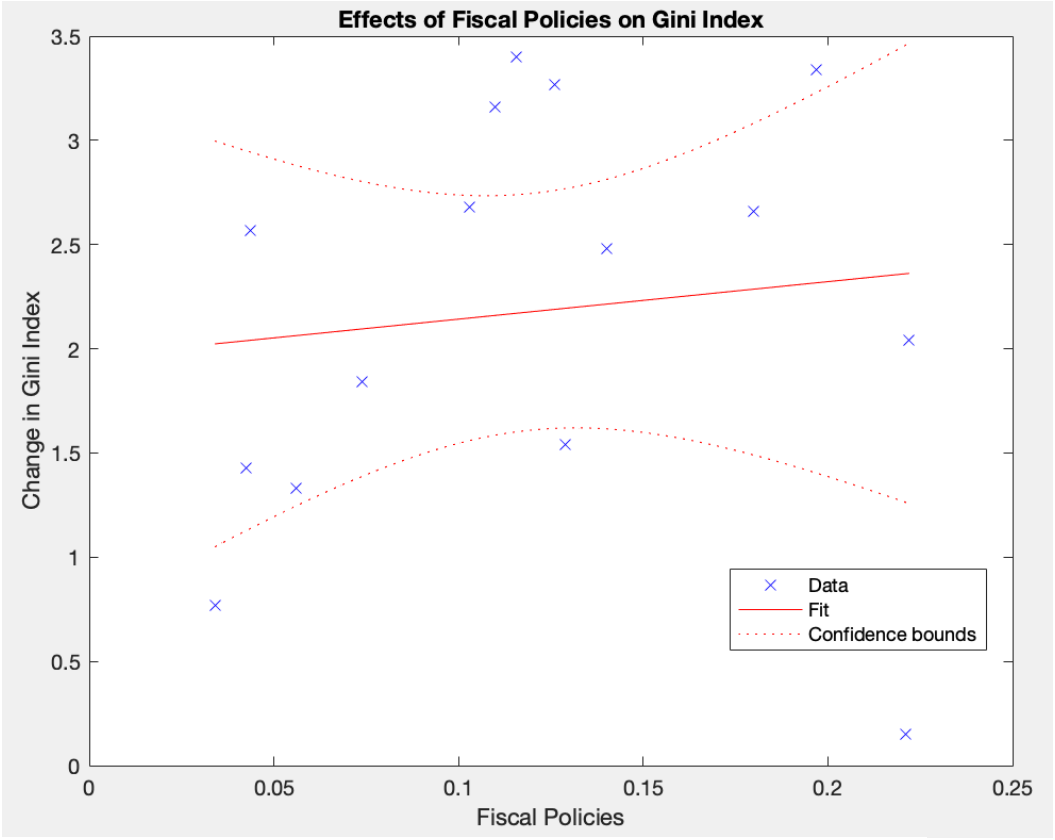


Figure 17 - Results Regression Policy Effects

The regression gives an estimated coefficient for x1 the fiscal policies, 1,7992. These results are not significant, thus there is no clear relationship between the s,cope of fiscal policies and the change in the Gini

Coefficient. For the variable x1 (fiscal policies), the standard error is considerably high, the tStatistic is too low and the pValue is also too high to be significant.

In the next step, I want to expand my regression, by controlling for two further variables. Accordingly, my regression will be set up as follows:

$$\Delta Gini\ Coefficient\ =\ \alpha\ +\ \beta_1 \cdot Fiscal\ Policies\ + \beta_2 x_2 + \beta_3 x_3$$

Where the controlling variables are:

x_2 = Drop in GDP in 2020 as the change in growth rate compared to 2019

x_3 = Number of Covid-19 deaths per 100.000 inhabitants

```
Linear regression model:
    y ~ 1 + x1 + x2 + x3

Estimated Coefficients:
                   Estimate        SE         tStat       pValue
                   ________    _________    ________    _________

    (Intercept)      2.1676      0.78878      2.7481     0.018956
    x1               2.3558       4.5864     0.51364      0.61767
    x2              -7.7334       8.7506    -0.88376      0.39573
    x3           -0.0049293    0.0056062    -0.87925      0.39807
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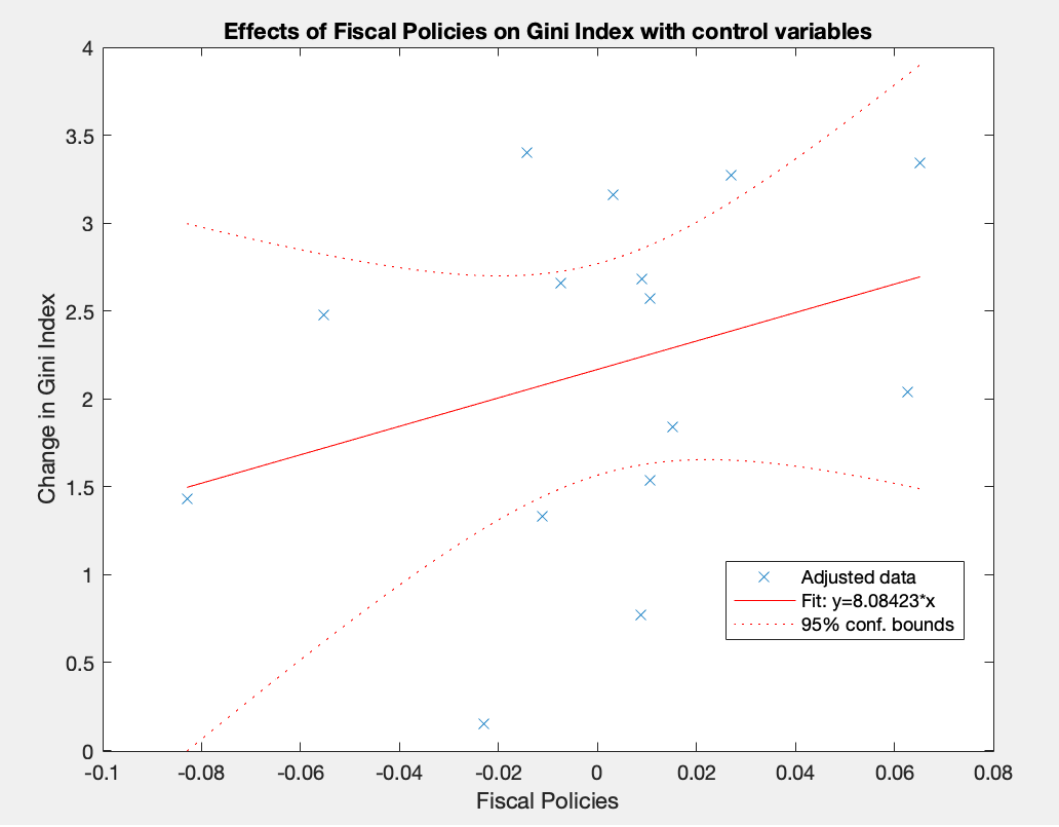

Figure 18 - Results Regression Policy Effects and Control Variables

In this case, when controlling for deaths and drop in GDP, the estimated coefficient for the variable x1, the fiscal policies, increases to 2,3558 with respect to the regression without control. This could indicate a stronger relation between the fiscal policies and the change in Gini Coefficient. However, also the second regression

also does not show a significant relationship between the Gini Coefficient and the expenditure on fiscal policies. Again the statistical thresholds are not appropriate to reject the null hypothesis. Accordingly, the data is not sufficient enough to make a clear statement about the effects of fiscal policies on the Gini Coefficient.

Conclusion Regressions

The regressions do not reveal a significant relationship between the scope of fiscal policies and the change in Gini Coefficient. Given the complexity of the issue and the limitations of the data, this is not surprising. However, it also conforms with the previous researches, as it does not show that inequality can be reduced through the fiscal policies which were implemented. Regardless of the efficiency of the fiscal policies, a possible explanation for these results could be that the economic shock is simply too strong not to affect inequality. Yet, this analysis still remains a picture of the moment and has no implication for the effects of the fiscal policies in the long run.

6. Conclusion

In my thesis, I have discussed the effects of Covid-19 policies on inequality. To do that I provided a general overview of inequality. How is inequality measured, what kind of inequality exists, and what are recent trends? The different levels of inequality are typically measured by the Gini Coefficient or by other popular ways to measure inequality, like the top and bottom shares. Regardless of the tool to measure inequality the quality of data remains highly important. The literature review shows, that global inequality has always been very large, but there have been different evolutions and trends of inequality over time. The global Gini Index increased from 0,6 in 1820 to 0,72 in 1910. In 2000 it reached again 0,72 and dropped slightly to 0,67 in 2020. They note that the peak was reached in 2000 and since then entered a descending trend (Chancel & Piketty, 2021). The recent trend regarding global income inequality shows a decrease in global inequality between countries. The decrease in global inequality can be attributed to the rise of the middle class in BRIC countries. Yet, the Theil index, for instance, reveals a simultaneous trend of rising inequality within countries. This trend is also seen in European and Anglo-Saxon countries. Research shows that the share of the top 10% of pre-tax income in Europe increased in all European countries from 1980 to 2017. For example, in Germany, the top 10% income share rose from 28% to 35%. However, research also shows that Europe has been more successful than the US at containing inequalities. The income differences between the United States and Europe are mostly driven by top incomes, which rose stronger in the United States than in Europe. The analysis of the development of the bottom 50% share and the top 10% share according to three groups, Anglo-Saxon countries, Mediterranean countries, and Nothern / Central European countries has shown despite the increasing trend, inequality remained lower in the European Union than in the Anglo-Saxon countries. The results further indicate regional differences across Europe. Like the difference between Northern Europe and the Mediterranean countries. This coincides with research that finds a link between countries that have been hit most by the financial crisis of 2007 and inequality (this concerns mainly southern European countries). I further discussed the different forces which drive inequality. These are technological change, changes in

economic structure, and the skill-biased labour markets. Challenges arising from technological innovation, like job disruption and education gaps, could lead to an even greater divide. Also, the rising returns to education, in form of a skill premium, let inequality rise. The differences in the evolution of inequality indicate that different social and welfare systems bring along different implications for inequality. This allows room to further investigate the efficiency of the policies and regimes in handling inequality. Different kinds of policies to remedy inequality already exist. These are either redistributive or pre-distributive. The redistributive policies are progressive taxes on income and wealth and transfers to individuals with lower income or health protection systems. Pre-distributive policies mainly focus on providing equal opportunities to incur human capital. Other pre-distributive policies focus more on labour market regulations, like a minimum wage. However, with the Covid-19 crisis trends have been shaken up and the emergency response to the Covid-19 shock led governments to introduce new policies. Governments mobilised enormous sums to remedy the negative effects of the Covid-19 shock. The policies, introduced as a response to the Covid-19 crisis, bear great potential to tackle inequality and to improve general welfare. Apart from the sums which are currently invested in businesses, digitalisation, better health systems, etc. the emergency might have caused a shift in policymaking. The emergency, caused by Covid-19, initiated new social welfare schemes or schemes of common risk-sharing in some countries. For instance, unemployment insurance schemes have been introduced where it has not yet been established (such as the USA and Canada) and Spain has introduced a new minimum wage scheme. In other countries existing schemes have been expanded in their flexibility on conditions in the European countries. Or in the European Union, the so-called Covid-bonds have been introduced. This is the first time, that the European Union issues common debt and is a step towards more economic integration. All these renovations could cause a change in policymaking and ultimately lead to a very different organisation of European macroeconomic policies. Apart from the renovations, the fiscal policies in response to the Covid-19 shock appear to be considered efficient in cushioning the negative economic impact of the crisis. A research by Midões and Seré (2021) shows the financial vulnerability of individuals in Austria, Belgium, Finland, France, Germany, Italy and Portugal. They find that considering a time horizon of three months about 31,2 million individuals, or 12.8% of the population, are financially vulnerable. It indicates that those individuals would suffer a substantial decline in their well-being if their privately earned income would fall away. However, early research on the Covid-19 crisis concerning inequality shows, that during the initial period of the crisis inequality decreased in many countries. During the first months of the pandemic, households income inequality has either decreased or remained relatively constant. This is shown by Almeida, et al. (2020) who find that the Covid-19 crisis would have increased the relative Gini Coefficient 2020 by 3.6 points, but given the policy response, the Gini Coefficient will reduce relative inequality by 0.7 points. And Clark, et al. (2020) find that relative inequality in most of the five countries fell between January and September 2020: a by-product of government compensation schemes has been to reduce relative inequality. However, in the long term, the picture is more likely to look different. Early research has also shown that lower-income households are more affected by the Covid-19 crisis. This stems

from different reasons. Once, the likelihood of being laid off or furloughed falls with higher earnings and wealth. A possible explanation for that is that some sectors were stronger hit by the crisis than others. But also wage premia are higher for workers who already earn more. This holds with the general trends and factors which drive inequality, the skill-biased labour market. My analysis contributes to these findings. As once it shows the scope of the fiscal measures and indicates, that in many countries fiscal policies have helped to sustain the level of disposable income. However, the analysis also rather shows, that income inequality measured by the Gini Coefficient increased through the pandemic and that the fiscal policies which have been implemented do not remedy these effects. The pandemic appears to be an idiosyncratic multi-period shock with different scopes and impacts on the countries themselves. This, combined with different levels to start with makes it complicated to analyse the effect of the policies. These levels regard already existing fiscal policies and automated stabilzation schemes, like flexible unemployment schemes, and other ongoing politico-economic factors, for instance, Brexit. The next complication arises in the limitations of the available information of policy responses. And finally, the general data situation is still too vague and mostly based on estimations to make a reliable statement. His research is interesting as it brings together many early sources on income inequality during the pandemic. It also shows the difficulties of early estimations and the complexity of evaluating inequality in a real-time frame. However, it depicts a momentum, which could later be useful to evaluate research techniques and to improve the quality of early estimations. It also shows the difficulties which come along with the limitations of the data.

Overview Figures

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