# Economic Inequality in a Conceptual Framework

Getting to know how inequality works and an application for the Netherlands

by drs. ir. J.W.M. (Wim) van der Meer


Supervised by dr. S.T.H. (Servaas) Storm & dr. U. (Udo) Pesch

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*''For whoever has will be given more, and they will have an abundance. Whoever does not have, even what they have will be taken from them.''*

The Matthew effect (Merton, 1968)

## Executive summary

In the last decades, a large rise in economic inequality has been endured in most countries of the world. While this process already started in the 1980s, the increased attention towards inequality took flight after the Great Recession in 2007-2009. Gradually, there is a starting (scientific) consensus that inequality is damaging on several accounts. While in the past the accumulation of wealth by some individuals could have been regarded as a success and a motivator for others to succeed, the perspective is shifting towards accumulation being caused by (unfair) advantages such as inheritances and a faulty economic system.

In this thesis, I unravel the various parameters which are connected to economic inequality. The importance of this work is that it formulates an integrated framework in which the parameters associated with (rising) inequality are presented in an interconnected manner. It shows that inequality is the outcome of a complex interaction of various drivers, facilitated by economic policies and legal structures. As a result, in many existing studies on the causes of inequality, researchers manage to identify one or more key drivers of inequality but are still unable to come to reach more definitive conclusions, because other correlating parameters have not been included during the research. To avoid this limitation of extant research, I was able to include a large set of parameters and analysed how these parameters are connected in the larger system by reviewing a great variety of sources including academic articles, grey literature, and various newspaper. The findings are organized by four separate dimensions, which combined form this thesis's foundation and the conceptual framework.

In the first dimension "The consequences of inequality", I find that economic inequality has negative consequences for various (vital) parts of society, i.e., health, education, democracy, and the economy. In general, these consequences are caused by the rich being able to create favourable conditions for themselves or unfavourable conditions being primarily present among the poor. Moreover, the lack of upward social and economic mobility (social integration) leads to socioeconomic stratification which, in turn, solidifies differences in behaviour and opportunities resulting in persistent differences.

Under the second dimension "The measurement of inequality", the techniques used to measure and quantify economic inequality are being explained. I find that three viable databases can be used for measurements, i.e., tax records, surveys, and rich lists, which have their specific advantages and disadvantages. The most complete dataset can be obtained by using these databases coherently and enables the most realistic representation of real life. However, quantifying economic inequality is no sinecure, also because the researcher can choose between a variety of indicators. I find that there are four indicator families which are used predominantly, i.e., Lorenz-curve based indices, general entropy-based indices, ratio-based indices, and poverty-based indices. Yet again, all of these indices have their specific characteristics, their optimal application, and their limitations. As such, to have an adequate representation of the inequality occurring within a society, one should not lean on one specific index value, but preferably use indices from every family type of indicators.

In the following dimension "The causes of inequality", I investigate the causation of economic inequality, which is divided into three categories, i.e., inequality in terms of income, wealth, and opportunity. In the review of income inequality, two distinct

processes are being recognized. The first process is the increased importance of income coming from capital caused by financialization, globalization, and technology. The second process is the difference in income growth where the high incomes experience large growths while the low-incomes experience little to no growth in income. As for wealth inequality, it is found to be mainly a consequence of income inequality, wealth transfer (inheritance), and life-cycle adjustments. As for opportunity inequality, it is found to be mainly mediated by the segregation and stratification within society between various socioeconomic groups.

The fourth and final dimension "Policies influencing inequality" concerns the opportunities a government has to make a direct impact on inequality. The most prominent policy tool in this regard is the tax & benefits system. This system can be split into two, where taxes are primarily used for tax revenue generation (which can be done progressively, especially for the income tax) which in turn can be used for the benefits policy which is doing most of the leg work to reduce inequality (as compared to the tax policy). Overall, returning aspects to inconsistencies within the system can be summarized as failing to make the system simple, transparent, neutral, or efficient by operating incoherently.

These four dimensions have been integrated into a conceptual framework and have been used to analyse economic inequality within the Netherlands. In general, the scientific outcomes found in this thesis are largely coherent with the narrative of economic inequality occurring within the Netherlands. It shows similar problems, although wealth inequality is of a larger concern within the Netherlands than (disposable) income inequality. This is mainly caused by the implemented tax system which treats wealth (income) favourably. However, when applying the model, new interactions are found which were not described within the model. It is uncertain whether these interactions have been missed during the research or whether these interactions are specific to the country. It would call for reverse-engineering the newly found interactions and reviewing their importance within the model. Moreover, it has been found that crises can play an important role in disrupting the system and have the potential to enhance economic inequality.

To conclude, this thesis created a functional conceptual model[1] which shows a large network of interactions, exemplary of the complex nature of economic inequality. It is the first in his kind of giving an overarching perspective on the field of economic inequality. As such, it enables new perspectives such as reviewing economic inequality as a system. This could lead to new research reviewing secondary effects of interactions and implemented policies. Moreover, the simplified overview enables problems to be recognized more easily and provides concise knowledge to be used as a reference work for others to be used. Most certainly, this conceptual framework will not be able to provide all the solutions to the complex problem revolving around economic inequality, but the newly provided narrative can change how people perceive and think about the problem. It is meant as a first, new step towards improving knowledge, research, and policies in the field of economic inequality.

[1] The conceptual model has also been published on the internet enabling to view the parameters and interactions with their specific explanations. Link: Conceptual framework for economic inequality

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## Introduction

In the past years, if not the last few decades, there has been an increasing interest in economic inequality. The moment when I became taken by the topic was when Rutger Bregman went viral because he held a speech at the Davos conference in 2019 stating that tax avoidance is a cornerstone issue in the topic of economic inequality (NOS, 2019). The simplicity of the statement, but also the call to attention for a problem that was not getting the attention it deserved, was a motivation to dive into the topic more thoroughly. When getting into the topic, it is almost impossible to not stumble upon the celebrated work of Piketty (2014), i.e., *Capital in the 21st century*. It has been a best-selling book over multiple accounts and gained several awards such as the Financial Times year award (De Slegte, sd). Overall, his book was monumental in attention to the field, to cite Timothy Shenk (2014):

> *"… stands a fair chance of becoming the most influential work of economics yet published in our young century. It is the most important study of inequality in over fifty years, …"* – T. Shenk (2014)

Within the book, Piketty brings to attention that inequality is on a rise with no end in near sight. He provides a sketch of (extreme) economic inequality returning to levels that were present in the late 19th century. At that time a small elite group was living as rentiers while a large portion of society was living in poverty (Piketty, 2014). This progression of the increasing wealth of the super-rich in the present time seems to be almost incomprehensible to normal people. For example, Oxfam (2018) wrote that the number of richest people needed to represent the total wealth of the poorest 3.7 billion decreased from 62 to a mere 41. Also, within the Netherlands the wealth of the elite society is spiralling upwards; in 2021 there was a record number of billionaires (45) and the amount of wealth required to enter the wealthiest 500 people was higher than ever before (110 million euros) (NOS, 2021).

On the opposite side of the wealth spectrum, there is the issue of poverty, i.e., having insufficient resources to function at a socially acceptable level (Sen, 1999), which is seemingly becoming a large problem among societies. While people mostly connect these problems to developing countries (or continents) such as Africa, poverty is also occurring much close to home. For example, in Great Britain, millions of people are faced with the issue to choose between "eating or heating" (NRC, 2022). On the other side of the pond, California (the 5$^{th}$ largest economy in the world) is struggling with rising homelessness due to the inability to provide (affordable) housing. The issue has escalated thus far that it is being considered a humanitarian catastrophe with people dying on the street, students living in cars, and the rise in tent camps along the pavements and parks (The Guardian, 2022). While a blind eye could be turned to these occurrences as they are not occurring in our backyard, the Netherlands is certainly burdened by problems of its own. For example, the total number of (registered) homeless people in the Netherlands has almost doubled from 17.800 to 32.000 individuals between 2009-2021 (NOS, 2021). Moreover, a similar trend is found for the number of people who require support from food banks. Between 2010-2020 it also almost doubled from 50.000 to over 90.000 individuals (Voedselbanken Nederland, 2020) and in 2022 alone another 6.000 applied for the foodbanks (NOS, 2022). This process has been aggravated by the energy crisis and rising

inflation and is causing fear and anxiety among the (low) middle-incomes. They are struggling to keep up with expenses and are reducing food consumption and avoiding to buy clothing. According to the NIBUD, this is a new phenomenon for this specific socioeconomic group (NOS, 2022).

Overall, these trends in poverty and wealth seem to indicate that economic inequality is becoming more of a prominent problem. However, economic inequality is in no sense a new issue when reviewing history. Already in ancient Greek times, Plato identified the problematic nature of inequality as being potentially disastrous for society (Bury, 1968):

> *"It is, as we assert, necessary in a State which is to avoid that greatest of plagues, which is better termed disruption than dissension, that none of its citizens should be in a condition of either painful poverty or wealth, since both these conditions produce both these results; consequently, the lawgiver must now declare a limit for both these conditions."* – The Laws, 744d (Bury, 1968)

To make matters even worse, it can be questioned if the assessment of Plato that the greatest plague of all, social disruption, caused by economic inequality is not already occurring right under our noses. On January the 6th 2021, the U.S. Capitol was besieged by a ravaging mob who were discontent with the democratic system. This was seen as a monumental event showing social and political disruption in a country (the U.S.) that is believed to be at the pinnacle of Western society. Parmigiani (2021) narrates that this monumental event is a (partial) consequence of growing economic inequality and the super-rich who dominate political power, being in line with Plato's assessment.

> *"To understand extreme political polarisation, and how a violent mob came to storm the US Capitol, we must consider the growing ability of the ultra-rich to transform their wealth into political power."* – A. Parmigiani (2021)

Parmigiani is not alone in his perspective. For example, also Bernie Sanders strengthens the view that democracy in the U.S. is dwindling as the rich are grasping control and creating an oligarchy (Sauer, 2022).

> *"Anyone who thinks we do not have an oligarchy right here (i.e., U.S.) is sorely mistaken."* – B. Sanders (Sauer, 2022)

Seemingly, large problems and consequences are revolving around economic inequality. However, solving the problems caused by economic inequality is difficult at best, and potentially even inherently impossible. This is caused by the fact that economic inequality can be described as a wicked problem. This has significant implications as the characteristics of a wicked problem, postulated by Rittel & Weber (1973), cause severe limitations. Keep & Mayhew (2014), for example, described that because of the various interacting parameters and numerous damaging consequences it is already difficult to even formulate a definitive problem statement for the topic.

While economic inequality is a difficult problem, there are also great opportunities to add significant contributions to the field. I found during the research that articles often attempt to identify (the size of the effect of) a parameter on economic inequality. But while

they did their research, they did not review it in an overarching conceptual framework. Seemingly, as noted by De Beer et al. (2018), a comprehensive framework that explains how the complex system works is missing.

> *''These and other new perspectives deepen our comprehension of inequality but do not make an already complicated story any clearer. What is lacking the most at the moment is an overall picture in which all loose threads are brought and knotted together. … Whoever could construct such an overarching story and draw clear lines in it would deserve as much fame as Thomas Piketty!''* [2] – de Beer (2018)

The absence of such a conceptual framework seems unfortunate and a missed opportunity to improve the field. For example, Yawson (2015) states that a framework can aid in the analysis of a wicked problem. Moreover, Raadschelders & Stillman (2017) state that a conceptual framework also is one of the most effective analytic tools to aid in the interpretation of descriptive research. Therefore, this thesis develops an overarching conceptual framework that provides a concise overview of the field. This is done by graphically representing the involved parameters and how these parameters are interconnected. The provided overview shows that the field of economic inequality is much wider than differences in the income and wealth distribution, it also involves, e.g., public perception, social stratification, developments in technology, and measurement techniques. Therefore, I will pose that the evaluation of economic inequality will ultimately be an integration of various disciplines which is going beyond solely the field of economics. The provided conceptual framework is perceived to function as a reference work to assist individuals through the large complexity of the field by recognizing issues, gaining knowledge, and assisting research. As such, while there is a lot to be done to solve issues revolving around economic inequality, this thesis provides a new perspective, which may enable new unventured potential in research, debates, and policy drafting.

[2] The citation is a translation from Dutch, the exact citation is as follows: *"Deze en andere nieuwe perspectieven verdiepen ons inzicht in de ongelijkheid, maar maken het toch al ingewikkelde plaatje er bepaald niet eenduidiger op. Waar het op dit moment vooral aan ontbreekt is een totaalbeeld waarin alle losse draadjes samen worden gebracht en aan elkaar worden geknoopt. … Wie een dergelijk overkoepelend verhaal zou kunnen construeren en daarin een heldere lijn zou weten aan te brengen, zou evenveel roem verdienen als Thomas Piketty!"* – de Beer (2018)

## Thesis Objective

As read in the introduction, there are indications that inequality is increasing and there is potential for considerable problems for society, including social and political instability. However, to my knowledge, economic inequality has not been analysed with the use of a comprehensive, over-arching conceptual framework although it possesses substantial advantages. For example, it could provide the potential to formulate policies in aid of each other and review their consequences in relation to other parameters. Moreover, it can create an overview of the complex field of economic inequality which has become tremendously large with difficult interactions. The absence of a (comprehensive, over-arching) conceptual framework can therefore be hampering the analysis of inequality and what to do about it. As such, there is a knowledge gap worthwhile to be tackled.

### Formulating the research question

Therefore, I will attempt in this thesis to create a conceptual framework that could aid in formulating potential policies and analysis of interacting parameters. To achieve this goal, I formulate the following research question:

**How does economic inequality function as a system?**

To be able to answer the research question, the following sub-questions need to be answered:

*1. Does economic inequality cause a problem?*

The most important aspect of the thesis is to explain why it is important to perform the research. While in the introduction some notions have been touched on, this is only the small tip of the iceberg. I want to validate the problematic nature of economic inequality more tightly to review the necessity of the analysis and provide input to the framework.

*2. How can economic inequality be quantified?*

To be able to understand economic inequality it is required to know how economic inequality can be measured. Without an indicator to represent economic inequality, it will not be possible to correlate economic inequality to other variables or parameters. However, to measure a specific characteristic, data input is needed for the calculations. Thus, an elaboration on data acquirement and data representation in relation to economic inequality will be needed.

*3. What is the cause of economic inequality?*

To understand economic inequality and how to potentially influence it, it is required to comprehend the input parameters causing economic inequality as economic inequality itself is the outcome variable of the system. Two different kinds of input parameters will be reviewed: 1. The parameters that are causing economic inequality and, 2. Policies that can be implemented to potentially reduce economic inequality.

Having formulated a research question and provided three sub-questions, I want to create an overarching structure for the thesis. In short, the sub-questions will be discussed and answered in four separate chapters and the complete conceptual framework

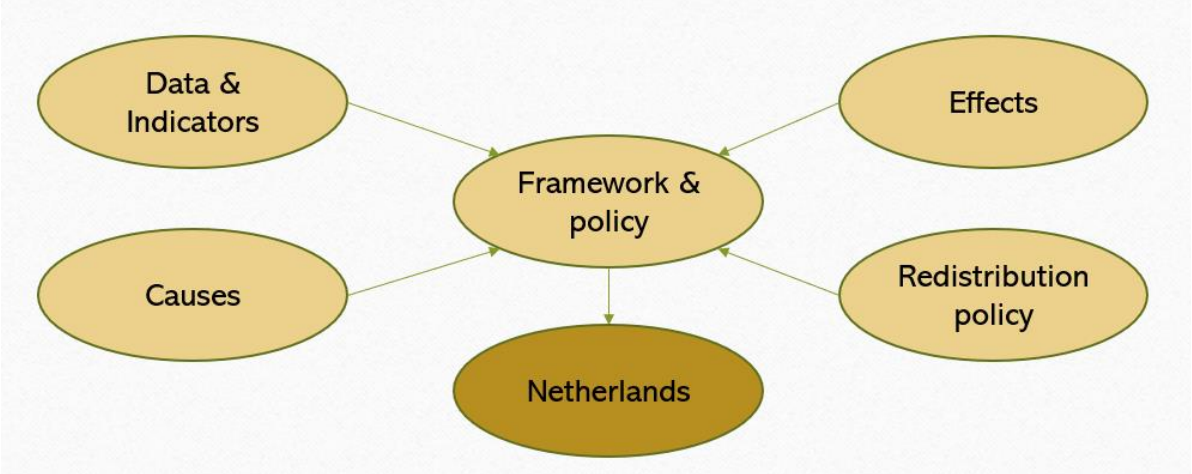


Figure 1 Method of approach for analysis of this thesis. *Note: The thesis consists of four pillars which are integrated into a framework and policy in the conclusion chapter After formulating the framework, it will be applied by reviewing economic inequality within the Netherlands using the conceptual framework.*

will be provided in the conclusion chapter. At the end of every chapter, the to-be-included parameters for the conceptual framework will be listed with a short explanation of why they are of interest to the conceptual framework. These parameters willed be called the 'building blocks' of the conceptual framework. After the four chapters, I will combine the 'building blocks' into a single conceptual framework. To reflect on the usability of the conceptual framework, I will investigate economic inequality within the Netherlands using the conceptual framework. This application will function as a proof of principle (showing its viability), but also as a test case scenario (exploring limitations and finding potential improvements). To summarize the structure of this thesis, a graphical representation of its design has been made and shown in Figure 1.

## Positioning the thesis

This thesis attempts to reach researchers, policymakers, and individuals who are interested in the topic of economic inequality. For these people there is currently no clear overview of the whole topic to understand and become acquainted with the field, let alone an overview that is easily understood. This limits their opportunity to comprehend the problems within the field and can lead to "simplistic" ideas for a potential solution that underappreciates the complexity of the system. As such, the goal of the developed conceptual framework is to provide an overview that helps stakeholders to gain a better and more comprehensive understanding of the complexity of economic inequality and the mechanisms behind the interactions occurring between the major causes of inequality.

For researchers, the thesis signals that it is important to review the topic as a systems problem and appreciate how various drivers of economic inequality interact. Moreover, it can lead to (improved) attempts to analyse secondary effects of policies and model indirectly connected parameters. As for the policymakers, the thesis highlights the complexity of the issue and the absence of the potential for a "silver bullet" policy to solve the problems revolving around economic inequality. It should inspire them to draft policies that are integrative and promote collaboration between various (institutional) bodies to investigate policymaking in a joint effort. As for interested individuals, the conceptual framework offers a direct overview of economic inequality and brings founded theory and current knowledge into a single narrative.

The necessity to improve knowledge and to enable perceiving economic inequality as a system is caused by the fact that economic inequality is growing in many countries around the world. Currently, we are seemingly not able to deter this progression with the currently employed policies. The conceptual framework developed in this thesis can, hopefully, be used for improved research, enriched policy drafting, and informed debating. This triad is of importance as debates can lead to democratic engagement on the topic, improved research leads to a better understanding of the topic, and enriched policies can lead to improved capabilities to obtain desired policy targets. These are only examples of the potential the conceptual framework has, much has still to be learned about how this conceptual framework can be positioned within the field. I hope that others can bring wider potential to the conceptual framework by further completing and evolving its structure.

## Thesis limitations

As economic inequality is a large topic, it will be required to put boundaries to the scope of analysis to enable the ability to have this thesis finished within the limited amount of time available. An intuitive form of analysis has been provided by Peterson (2017). He distinguished the problematic nature of economic inequality into two different aspects. These are *1. intrinsic aspect*, i.e., the justification of economic inequality, and *2. instrumental aspect*, i.e., the quantifiable effects of economic inequality.

In this thesis, I will (mainly) discuss the instrumental aspect. The reason for this limitation is that it is difficult to make the intrinsic aspect quantifiable. It largely revolves around the philosophical debate about what is "just". Exploring this aspect of economic inequality will therefore be rather different from the instrumental aspect and requires another type of literature review.

Moreover, it should be noted that economic inequality complies with the characteristics of a wicked problem[3]. Due to these characteristics, there are several constraints to this thesis. The characteristic "*The perspective of the analyst determines the solution to the problem*" causes that there will always be a form of personal perspective and, as such, a form of judgement that touches on the intrinsic aspect of economic inequality. While it cannot be escaped that the aspects are sometimes in close relation to each other, I will avoid evaluating the intrinsic aspect in depth.[4]

Other characteristics of the wicked problem cause important limitations to the potential solution which can be provided to the issue. These characteristics are: "*No stopping rule*", "*Solutions are not true/false, but better/worse*", "*Solution cannot be tested*", and "*Only a sub-set of all solutions can be identified*". The broad consequence of these characteristics is that a solution (but also every other solution formulated in regard to this topic) can only be formulated as a proposal without the possibility to test its quality nor it being free of judgement. In sum, the solutions posed by this thesis will most definitively not be the only solutions that can be formulated, it is a proposal that follows from my perspective.

[3] The full description of wicked problem and its characteristics can be found in Appendix .

[4] For the people who are interested in the intrinsic aspect of economic inequality, I would like to refer to the philosopher Rawls (1971). In his monumental work *A Theory of Justice,* he elaborates on the interaction between justice and economic inequality.

I will attempt to provide a new angle on economic inequality but will certainly not be the last to write about the topic. The problem is highly complex and ever-evolving and as such can metaphorically be compared to a hydra. Whenever one of the many problems is being tackled, another problem will sprout. However, the current tactics are not appearing to be bringing economic inequality to a halt, it is even spiralling faster out of control. I hope that this research can bring a stop to this process.

## Research methodology

In terms of its research methodology, this thesis is a literature review that creates out of a variety of literature contributions a coherent narrative and attempts to incorporate the literature into a conceptual framework. For such a type of research, an integrative literature review is most suited (Snyder, 2019). However, there is no standardized format to which integrative reviews adhere besides that the methodology should explain how literature has been identified, analysed & synthesized, and reported (Torraco, 2005). In short, the reporting will consist of a written report (this thesis) and a graphical representation with a conceptual framework. As for the identification and analysis & synthesis, I will provide a more extensive explanation down below.

### *Identification*

A key notion to an (integrative) literature review is identifying all the relevant literature to be included in the research. To maintain a structured form of identification, I attempt to use a single search strategy by using a single search description template and dividing it into three different lemmas. The first lemma represents the overall theme of this thesis, i.e., inequality. The second lemma represents the key concept used for each of the analysed dimensions reviewed over the four chapters: 1. How to quantify economic inequality, 2. What is the cause of economic inequality, 3. What is the effect of economic inequality, and 4. How to influence economic inequality. The third lemma represents the analysed topic within one of the key concepts. The specific key concepts and topics are shown in Table 1. This search description has been used in the search engines Web of Knowledge and Google Scholar. To summarize, the search description is defined as follows:

"(Economic OR Income OR Wealth) Inequality" AND "Key Concept" AND/OR "Topic"

It is important to mention that this thesis is explorative in nature causing that it is a priori unknown what needs to be included and what not. Therefore, the described search strategy will be an iterative process. In short, this means that after a paper has been reviewed by its content the lessons learned can create a (new) perspective on that (sub-)topic which causes an adaptation for the search strategy. As such, the search process is dynamic causing a continuous evolution of the set of analysed parameters into a more "appropriate" set of parameters. Therefore, it should be realized that the search terms in Table 1 only mention the terms used within this thesis but do not include all the potentially relevant search terms available to the topic.

### *Analysis & synthesis*

The analysis of the output from the identification process occurred by ordering the literature from the search output by the number of citations after which the first 50 to

Table 1 Keywords for search input used for this thesis

| Thesis | Section | Key Concept | Topic |
|---|---|---|---|
| Economic inequality | Quantifying Inequality | Measurements | Taxation, Household Survey, Rich Lists |
| | | Indicators | Lorenz Curve, Gini Coefficient, Generalized Entropy, Theil Index, Atkinson's Index, Ratio, Palma, Poverty |
| | Causation of Inequality | Income | Labour Productivity, Labour Market, Trade Union, Minimum Wage, |
| | | Wealth | Return on Capital, Elasticity of Substitution, Inheritance, Bequests |
| | | Mobility | Equality of Opportunity, Relative/Absolute Mobility |
| | Effects of Inequality | Education | Social Congestion, Entrapment, Shadow Education |
| | | Democracy | Distributive democracy perspective, unequal democracy perspective |
| | | Economy | Propensity to consume, Galor-Zeira model |
| | | Health | Absolute inequality hypothesis, Relative inequality hypothesis |
| | Influencing Inequality | Taxation | Elasticity of Labour, Optimal Taxation Theory |
| | | Benefits | Pension System, Income Insurance |

100 articles were scanned by article title. The number of reviewed titles depended on the number of selected relevant titles which was aimed at roughly 10 per search query. If the title seemed to be of interest, then the abstract was reviewed for its content. If the abstract was also of interest, then the introduction and conclusion portion of the article was read for content. In this, the introduction primarily provided as an indicator for potential additional reading while the conclusion provided additional insight into the analysed parameter/interaction. Whenever clarification on the research was needed the methodology and results were also read to evaluate the quality and limitations of the research. Moreover, when a new topic was found (and thus added to the table as a search term), a general Google search inquiry regarding that topic was used to obtain a fast familiarization with the topic. I also reviewed cited literature in articles that passed the abstract selection procedure when deemed to be of interest for the thesis.

However, it is hard to define specific inclusion and exclusion criteria for the literature found. In part, this is caused by the fact that four different dimensions are being reviewed which all have a different scope of analysis. Thus, an exclusion criterium that is viable for one of the sections can be hampering analysis for one of the other sections. Also, because the search process is dynamic there is a large possibility that drafted exclusion criteria are viable during one part of the research but are hampering further analysis in another part of the research. Therefore, I will state general remarks for the inclusion criteria which are to be used as guidelines.

1. The articles are written in English or Dutch, the latter being of main interest when reviewing the Netherlands specifically.

2. Preference for published articles over grey literature, although the latter will frequently be reviewed because the topic is often discussed by (international) institutions such as the OECD, UNICEF, World Bank, governments, and others.
3. Preference for recently published articles. The topic concerning economic inequality has been rapidly developing in the past two decades, with an important landmark being the work of Piketty (2014). Moreover, the Great Recession between 2007-2009 brought a large shift within the world of economics (Turner, 2017). As such, analyses after 2009 are to be preferred, in line with the statement of Peterson (2017) that after the Great Recession a surge of articles have been published regarding economic inequality.
4. Preference for more frequently cited articles over less frequently cited articles.
5. A focus on articles reviewing the instrumental aspect value of economic inequality

As for the synthesis of the integrative literature review, this mainly occurred by compiling the provided theories and models from the selected articles. These were bundled by their respective themes and distributed amongst one of the four pillars of the research. It was attempted to provide high-quality articles which provided an overview of the various themes to assist in grouping themes and topics together.

However, on several occasions, the themes had affinities with more than one of the four pillars as the treated subject was overlapping. In these cases, the themes would frequently be mentioned in multiple pillars but were only extensively discussed in one of the pillars. In which pillar the theme would be explained more extensively was decided by the "flow of the narrative" and, as such, was somewhat subjective. However, it is not of large consequence in which pillar-specific themes were being discussed as long as they were discussed and were included in the conceptual framework.

As for the overarching synthesis, i.e., the conceptual framework, it was decided to create a graphical representation of the field which could be understood simplistically. During my time at the TU Delft, I encountered graph theory that has the ability to show various parameters (using nodes) and their interconnection (using edges). While graph theory comes from mathematics, its potential to be used for creating systems and showing pairwise interactions was deemed suitable.

### The relevance of this thesis to the MoT programme

The MoT programme is at its centre concerned with appreciating values and conducting responsible innovation. As such, MSc theses written within the programme engage with these notions when dealing with issues in the management of technology. This particular thesis is concerned with one of the most essential values of a society, i.e., the right to equality, and finds that this value is heavily under pressure. As will be shown within this thesis, economic inequality is on the rise over multiple dimensions and demonstrations of unfairness within the system will be presented. In the effort to conduct responsible innovation, this thesis develops a conceptual framework to be positioned as a tool to gain improved comprehension, promote discussion, and assist research done in the field of economic inequality. I hope that you, the reader, and the public, will become engaged in potentially the most essential and crucial problem of society.

# 1. Inequality's influences – Are differences bad?

Economic inequality and society are so intimately intertwined that it correlates to virtually every aspect of life one can think of. Economic inequality can be linked to topics such as (but not limited to) crime (Fajnzylber, Lederman, & Loayza, 2002), behaviour (Ku & Salmon, 2009), life satisfaction (OECD, 2017), and environment (Gunewald, Klasen, Martinez-Zarzoso, & Muris, 2017). However, due to time constraints, I cannot investigate all of these interactions. In the attempt to limit the scope of analysis, the works of the IMF (Dabla-Norris, Kochhar, Suphaphiphat, Ricka, & Tsounta, 2015) together with Peterson (2017) indicate that four domains are of the highest importance, i.e., health, democracy, education, and the economy. In the light of their reviews, I will only discuss those four dimensions and leave the other potential dimension for another review.

## 1. *Health*

Health is a key concept due to its vital importance to a human being. It does not only concern the most essential aspect, i.e., life or death, but also life satisfaction and being able to live in good health are seemingly at stake (OECD, 2017). Also from the economic perspective, health is important as bad health relates to lost working hours. For example, sick leave mostly occurs significantly more often for people with lower socioeconomic status (Kristensen, Jensen, Kreiner, & Mikkelsen, 2010) but sick leave is predominantly compensated for high-wage employees (Gould, 2021) causing inequality among people who are hurt by bad health and who are compensated for it.

According to Pickett & Wilkinson (2015), economic inequality has large implications in relation to health. They show that a reduction of the economic inequality within the UK towards the OECD average would cause a reduction of 39 billion pounds spent annually on mental health. Moreover, if all OECD countries would bring down their Gini coefficient below 30 then a 9.6% mortality reduction for the cohort 15-60 years old (equating to 1.5 million people annually) would be averted (Pickett & Wilkinson, 2015).

## 2. *Democracy*

This key concept is chosen as the governing entity implements redistributive policies such as taxes and benefits. If the governing entity, which mostly is a democratically elected entity in western society, is influenced by economic inequality then the opportunity to effectively alter economic inequality could be hampered. This would be a critical notion if the rich population is in control of the democratic system and would use their power to reinforce their position by implementing favourable policies.

This notion stands central in the Benabou model, which states that increasing inequality causes enhancement of the power of the rich which causes lower demand for distribution (Newman, Johnston, & Lown, 2015). This notion does not seem to be farfetched; Gilens & Page (2014) reviewed implemented policies in the US depending on the preference of the general population and the small elite. They found that it is not the general population that guides policies to be adopted, but an elitist group. Policies that were favoured by the elite, but disfavoured by the general population, were still being implemented as policy.

### 3. *Education*

This key concept is chosen as education provides the potential to obtain jobs with high earnings. If economic inequality causes the rich to gain an advantage early in life by, for example, obtaining favourable educational positions leading to higher educational outcomes, then it could cause self-reinforcement of the economic inequality.

There are (indeed) various indications that there is a positive correlation between economic inequalities and differences in education (Killewald, Pfeffer, & Schachner, 2017). Abdullah et al. (2015) show that there is a general trend toward inequality reduction with an increase in education. This decrease is largely caused by the fact that education causes the poor population of society to earn higher wages by which the gap between poor and rich reduces.

### 4. *Economics*

This key concept is chosen due to its close interaction with economic inequality itself. Living standards and average/median income can improve when the economy grows. However, if economic inequality (negatively) influences economic growth or has the effect that economic growth is only benefitting a few, then it is not possible to create systematic improvements for the whole population.

Currently, there are indications that countries are (indeed) experiencing stunted economic growth due to economic inequality (Cingano, 2014). However, the interaction between economic inequality and the economy is difficult to ascertain. For example. Stiglitz (2016) showed for Western countries, which have similar technology, GDP, and productivity, have large differences in their before-tax distribution. He states that there is no general theory that can explain why economic inequality is occurring.

Each of these domains will be discussed at a larger length and an overview will be given of the current standings within that field in relation to economic inequality. The chapter will be closed by providing several issues for this research and providing the 'building blocks' to be included in the conceptual framework.

## 1.1 Health

Health is an important factor in anyone's life. Sadly, not everyone is blessed with a healthy life and differences occur. While some causations seem to be rather obvious, such as the interaction between smoking and lung cancer (U.S. Department of Health and Human Services, 2010), others are more difficult to grasp. Such as the interaction between economic inequality and health. For example, the wealthiest Americans live 10-15 years longer than the poorest Americans (Dickman, Himmelstein, & Woolhandler, 2017). This occurrence is not only present in America, but also in other developed countries, such as Germany, (Kroll, et al., 2017), Italy (Lallo & Raitano, 2018), and the UK (Iacobucci, 2019) encounter this phenomenon. It seems to be strange that in high-quality healthcare systems the amount of wealth carried in one's back pocket makes a difference in life expectancy.

The fact that differences occur between population groups has been acknowledged in the monumental work of Rose (1985). He created the vital concept that diseases, whatever their kind can have different health outcomes between population groups while the core cause, i.e., the disease, is exactly the same. Within the field of medicine, research

has been performed to understand these differences caused by, for example, gender, race, and age. However, this thesis will review how economic inequality specifically relates to health. On this matter there are two perspectives (Deaton, 2003):

1) *Absolute income hypothesis*

The theory that health comes with certain costs and therefore a certain threshold of wealth/income must be surpassed to be able to gain all the health benefits

2) *Relative income hypothesis*

The theory is that the difference in health is caused by differences in characteristics/behaviour of socioeconomic classes based upon the distribution of wealth/income.

Before explaining these hypotheses in more depth, it is important to realize that besides the discussion of which hypothesis seems to be the most valid, the fact remains that it has been widely acknowledged that health problems are more frequently occurring with decreasing socioeconomic status (Marmot, Ryff, Bumpass, Shipley, & Marks, 1997) (Gruenewald, et al., 2012). Among others, they have a higher prevalence of teenage pregnancy, lower expected life, lower expected life in good health, higher obesity, and higher smoking. This is only a shortlist in the long run of various negative health issues which are impacting the lower socioeconomic classes more heavily. The "amazing" conundrum is that diseases of affluence, i.e., rich people's disease, are experienced by the absence of wealth rather than the abundance of it.

### Absolute income hypothesis.

The absolute income hypothesis revolves around the notion that a shortage of financial resources causes inaccessibility to health-related goods and services. The required financial resources can be portrayed as a specific threshold that needs to be overcome to gain full accessibility to health services (or required goods and services aiding health). To illustrate, malnutrition and deteriorating health are a large problem in Africa which is caused by a shortage of financial resources to buy food. A corresponding threshold that echoes the absolute income hypothesis is the International Poverty Line which represents the minimum consumption needed to live, including costs for basic food, living, and clothing (but already excluding water, electricity, and sanitation costs) (Kenton & Kelly, 2020).

While the truly basic issue of not having enough food could be experienced as a problem far away from home, the inability to pay for health-related concerns because of the lack of financial resources is also experienced in developed countries. For example, 23% of the working-age adults in the US did not go to a doctor because of financial issues and 19% did not fill their prescribed medicine due to unaffordability (Collins, Rasmussen, Doty, & Beutel, 2015). This showcases that the shortage of financial resources can also impede health in a developed country.

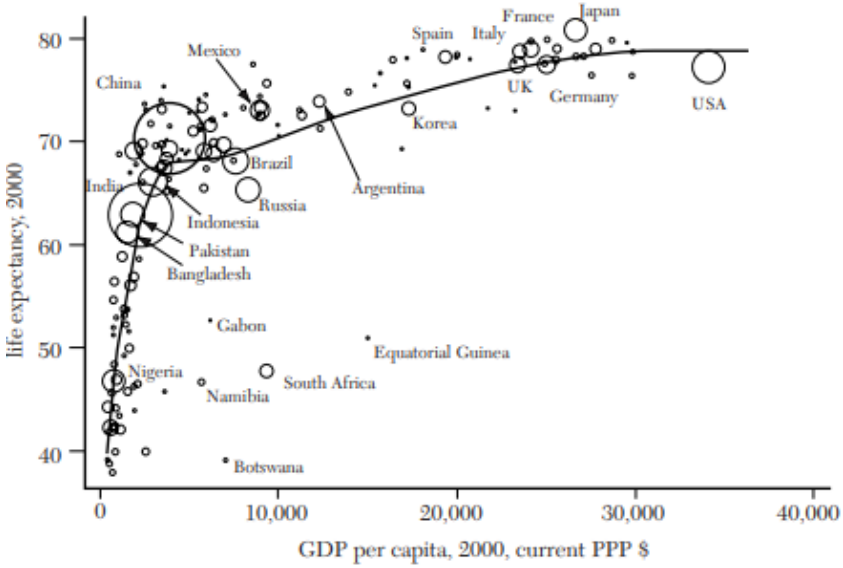


Figure 3 Preston Curve: Relation between GDP per capita (adjusted for PPP) and life expectancy. *Note: Data from the World Bank in 2002 has been used. The size of the circles indicated relative population sizes. A solid line is a population-weighed nonparametric regression. This figure has been obtained from* **(Deaton, 2003)**.

Lenhart & Otto (2017) found that improving the lower incomes can improve health outcomes as it lifts people out of poverty, increases doctor consultation, medical needs, and behavioural adaptations. Moreover, the developing countries had a stronger correlation between improved minimum wage and health than developed countries do. One could theorize that this difference between developing and developed countries could be caused by the fact that developed countries already met the minimum financial resources to afford health-related goods and services which the developing countries did not. As such, the results would fall in line with the absolute income hypothesis.

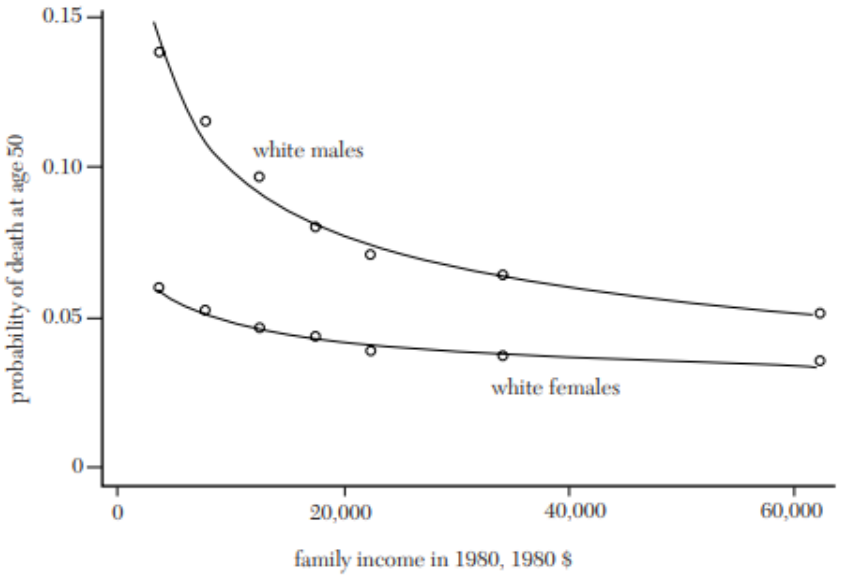


Figure 2 Relation between household income and probability of death at age of 50. *Note: Probability is based upon 3.288 days of follow-up time from interviews around 1980 using data from the National Longitudinal Mortality Study. This figure has been obtained from* **(Deaton, 2003)**.

Deaton (2003) also points out that the absolute income hypothesis would be most logical as it would relate poverty to health instead of a direct causal link between income inequality and health. He states that it would make little sense that the financial resources owned by the rich would cause the poor to have worse health outcomes. In his reasoning there is universal access to health services, thus health should not correlate with the income distribution.

### Relative income hypothesis

The relative income hypothesis revolves around the notion that health is related to economic inequality. Moreover, it is recognized that health inequalities also become worse with increasing economic inequality (Wilkinson & Pickett, 2006). Pickett & Wilkinson (2015) support their claim for a causal relation between income inequality and health by plotting income inequality against health inequality, as shown in Figure 4. In their research, they show that with increasing inequality, irrespective of average income, health deteriorates. This issue of interaction between economic inequality and health becomes even more problematic when remembering that economic inequality is seemingly on the rise with no end in sight (Piketty, 2014). This would give a grave prospect for health inequalities in society in the future.

The idea behind the relative income hypothesis is that health inequalities occur because of the stratification of society where the lower strata will experience various health issues due to their (socioeconomic) position. There is an abundance of theories that attempt to specify this causation, e.g., Mackenbach (2012) recognizes 9 different theories, but it will be beyond the scope of this thesis to review these in-depth. When reviewing the correlations one finds that at the bottom line that there are three mediators (Mackenbach, 2012): 1. Strata have common characteristics due to clustering by differences in social mobility, 2. Strata have different access to financial resources causing differences in access to services, and 3. Strata experience differences in benefits because of their characteristics. To make the interactions more intuitive, Gruenewald et al. (2012) created


Figure 4 Relation between income inequality and health and social problems. *Note: This figure has been obtained from* (Pickett & Wilkinson, 2015).

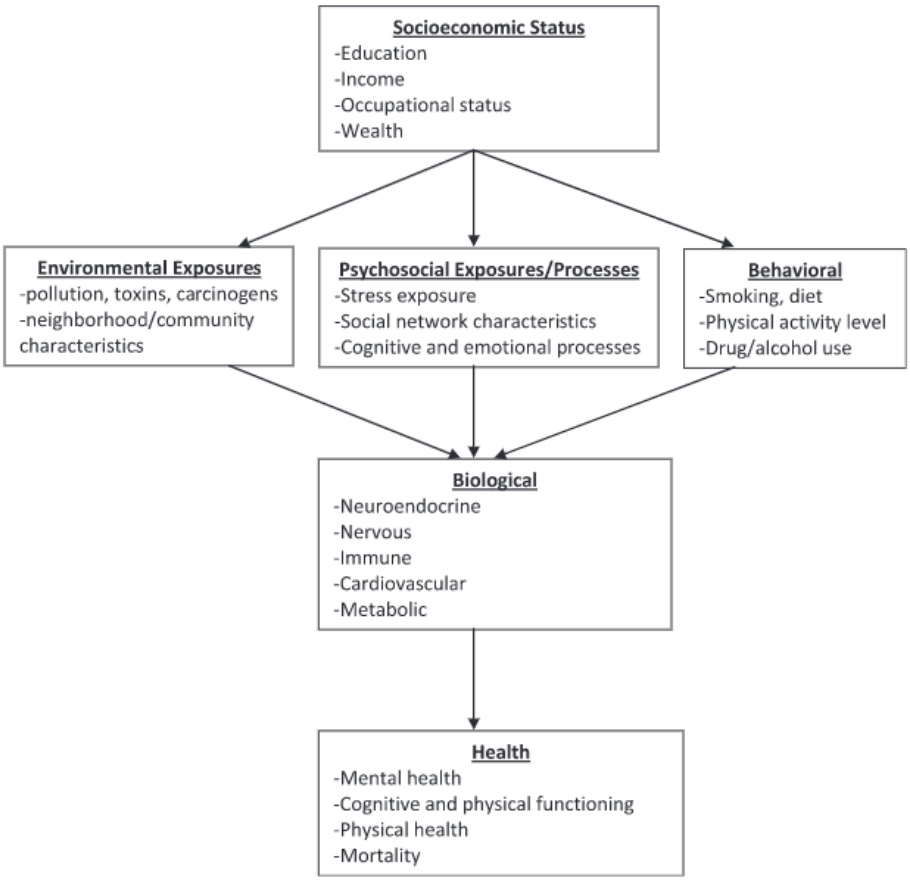


Figure 5 Conceptual model of interaction between socioeconomic status and health outcomes. *Note: This figure has been obtained from* (Gruenewald, et al., 2012).

a conceptual model to show the interaction between socioeconomic status and health outcomes, as shown in Figure 5.

Pickett & Wilkinson (2015) state that the effects as immensely impactful. They show that, if the UK would bring its inequality down to the OECD average, it would cause a reduction of 39 billion pounds annually. They also show that, if all OECD countries would be able to reduce their Gini coefficient (an indicator of inequality, this will be explained in Chapter 2: Quantifying Inequality) beneath 30 there would be a reduction of 9.6% in total adult mortality between 15-60, i.e., a reduction of 1.5 million deaths on annual basis (Pickett & Wilkinson, 2015).

A counterargument to the relative income hypothesis is the income artefact effect. In essence, the effect states that increased inequality relates to an income/wealth transfer from the poor to the rich and thus causing impoverishment at the bottom. Consequently, one could point at the absolute income hypothesis and state that increased inequality simply causes more people to be below the threshold required to support adequate health. However, while reviewing the impact between income inequality and health outcomes, Babones (2008) specifically corrected the results for the income artefact and found that the correlation still showed a significant correlation between income and health.

## Concluding remarks

Both the absolute and the income hypotheses have founded logic to their theorem, and I will certainly not be able to conclude which one is better. However, there are

interesting remarks to be made. At first, it could well be that both theorems are right, but it is situational which hypothesis is dominant. Second, economic inequality and health are interconnected to each other through a bidirectional interaction. So, income/wealth affects health, but health also affects income/wealth, these interactions are called forward and backward causality respectively.

Fogel (1994) makes the bidirectional characteristic illustrative by explaining the situation in the 17th and 18th centuries. At that time there was a large group of the population who were malnourished because they were not able to afford to pay for food. However, due to the malnourishment, they incurred health problems and were unable to provide labour and gain (enough) income to obtain food. As such, there is a cycle where health affects income, and income affects health. This bidirectional characteristic makes it difficult to state whether economic inequality is a representative or a consequence of the average health.

Nonetheless, there are indications that income has a larger effect on health than vice versa (Muennig, 2008). However, Muennig notes that this effect differs throughout life. For example, in early life and after the age of retirement this correlation is weaker because in those periods of life no/little work is performed and health cannot impact income. Interestingly, Arber et al. (2014) made an extension and showed that it is rather subjective financial well-being rather than objective wealth which correlates with health. While this distinction could be of interest, e.g., one can create a policy that aims at subjective financial well-being, I will refrain from delving any further into this distinction as it would be outside of the scope of this thesis.

As to the dominance of one hypothesis over the other, Dorling et al. (2007) showed that teenage pregnancies are correlated with low-income, i.e., absolute income hypothesis, but this was aggravated by increased income inequality within society, i.e., relative income hypothesis. Moreover, Deaton (2003) states that the absolute income hypothesis is important for poor economies whereas the relative income hypothesis is important for rich economies. In poor economies increasing inequality does not alter national health by large margins as only a few will be pulled above the threshold. In rich economies, the average income lies above the threshold, so if all the wealth would be equally divided everyone would have the ability to pay for good health. However, because of economic inequality, some people are having an income beneath the threshold. As such, it is inequality that matters for rich countries. Overall, one could say that both hypotheses are valid, but their relative importance is situational and dependent on the national economy.

Overall, it should be noted that economic inequality will only be a (small) cog in the whole wheel when considering the causation to health inequality. While there is the certainty that some can use financial aid, solving economic inequality will not be the "silver bullet" that solves all health-related inequalities.

## 1.2 Democracy

The importance of democracy to economic inequality is because economic inequality is viewed to be a consequence of implemented policies. For example, decisions revolving around the tax & benefits systems, education, and labour market regulation all influence economic inequality, being it either directly or indirectly (Fuentes-Nieva & Galasso, 2014). In Western society, these policies are in general implemented by a governing entity that can be elected by the vote of the society. However, as inequality has

been on a rise (Piketty, 2014), it can be questioned whether democracy is being ineffective to bring change or, maybe, voters simply do not care whether economic inequality is on a rise. When reviewing various policies, one can find that several made inequality even more severe while other policies could have been enacted causing (but were not) which would have curbed economic inequality (Bonica, McCarthy, Poole, & Rosenthal, 2013).

The current question which arises is "How it could have been possible that economic inequality has been increasing over the past decades within a democratic system?". While it can be that voters are democratically choosing for this to occur, it is far more frightening if this occurs because the rich can steer policies in their favour. The fact that economic inequality has been increasing over the past decades would make excluding the latter process foolish. The statement of Louis Brandeis, formerly seated in the Supreme Court of the United States, seems to be a warning for this problem (Irving, 1941):

> *"We may have democracy, or we may have wealth concentrated in the hands of the few, but we cannot have both."* – L.D. Brandeis (Irving, 1941)

This quote signifies the essential notion behind politics, either society has a population that controls via democracy, or it is controlled by the few. Overall, this statement can be distinguished into two perspectives that explain the relation between economic inequality and democracy (Newman, Johnston, & Lown, 2015):

1) *Redistributive democracy perspective*

The average voter will direct the political environment by democratic process toward more redistribution

2) *Unequal democracy perspective*

The rich can steer government policy into their interest which becomes easier with increasing inequality

For this thesis, I will elaborate on the underlying perquisites for these perspectives and not attempt to prove which one of the perspectives is true. However, there are indications that the unequal democracy perspective seems to be dominant as inequality increases but limited efforts are attempted to reduce the inequality (Kelly & Enns, 2010). The concern for inequality being damaging to democracy is seemingly timeless as can be seen from the statement of Daniel Webster, former secretary of state in the US in 1850-1852 (Webster & Whipple, 1879):

> *"The freest government, if it could exist, would not be long acceptable if the tendency of the laws were to create a rapid accumulation of property in few hands and to render the great mass of the population dependent and penniless"* – D. Webster (Webster & Whipple, 1879, p. 45)

### Redistributive democracy perspective

As mentioned earlier, Plato already recognized that disruption of society can occur when inequality becomes too large (Bury, 1968). In more recent times, also Cramer (2005) noted that inequality seems to have a pivotal role in numerous theories to cause revolt

and rebellion. The central essence is that if politics does not control (perceived) inequality, then the population itself will demand it.

The preference for redistribution often revolves around the median voter theorem which became famous by Meltzer & Richard (1981). The theorem states that with an increasing difference between the median and average income a greater demand for redistribution will occur. While this theorem seems to be elegantly simple, several complexities can cause that the median voter theorem will have difficulties in functioning. Somewhat loosely translating Hauser & Norton (2017), the inadequacy to turn the median voter theorem into effect are: 1. information bias, 2. it can be caused by a false sense of necessity to desire redistribution, and 3. varying perspective towards economic inequality and democracy. Moreover, it is also found that trust in the (democratic) system is of importance.

### *Information bias*

A key notion for the redistribution democracy perspective to be effective is that the population needs the right information. Quite simply, if the voters are not aware of the inequality occurring, then they cannot demand change of the inequality. Gimpelson & Treisman (2018) reviewed the prerequisite of whether the population was aware of the distribution by performing research in 40 different countries. They presented five different inequality distributions to respondents and only 24% of the people pointed at the correct inequality distribution, (which is only 4% better than the guess rate). Consequentially, they reviewed the correlation between perceived inequality and demand for redistribution and found a high correlation. As such, Gimpelson & Treisman (2018) state that the absence of preference for redistribution occurs because the population is unaware of the economic inequality occurring.

At first, it could thus be that one does not know what the distribution looks like. Either by not having received any information or having received the wrong information. When reviewing this issue, one could think that one would simply one could state that schooling is required concerning this topic. However, Kuziemko et al. (2015) show that educating the population about the misperception of inequality is a difficult task. They found that there were two different groups: 1 uninformed, i.e., had no prior knowledge about inequality distribution, and 2. misinformed, i.e., having prior knowledge about inequality distribution but not matching the actual distribution of that society. While informing uninformed people about the actual inequality caused an increased demand for redistribution, informing the misinformed did not cause a significant change in their redistribution preferences (Kuziemko, I, Saez, & Stefanie, 2015). Thus, while a portion of the population could switch their opinion about inequality, a sizeable group will retain their opinion even though it is based upon the wrong information.

In essence, the articles by Gimpelson et al. (2018) and Kuziemko et al. (2015) show that a large portion is inadequately informed about inequality but presenting them with the right information does not lead to a change in policy preferences when they already were misinformed. However, solving this hiatus in information has the potential to make the redistributive democracy more effective. According to Cruces et al. (2013) people who became aware of the actual distribution favoured political reforms for redistribution. In essence, this would mean that either schooling is required on the subject of inequality before people become misinformed or constant nudging is required to rewire misinformed

beliefs. Although the false belief of belonging to the middle could be slightly different from information bias, I perceive a large similarity which causes that I will refrain from discussing it (to prevent redundancy) and continue to the third notion.

### *Perspective*

Not only is information important, but also how one interprets the information has a large consequence on whether a person gets into action. The interpretation is largely dependent on how society perceives inequality, is it a bad thing that needs changing? For example, Starmans et al. (2017) describe that inequality is not deemed to be negative, but the question revolves more around the fairness of the inequality. As long the people believe the inequality is caused by fair characteristics, mostly referring to meritocracy, and there is (high) income mobility present, then its existence can be accepted.

Not only can these characteristics differ between nations (and societies), but the ethos of the country can also be of large influence. For example, the redistribution differs largely between Western Europe and the USA, with the former having twice as much redistribution. According to Alesina & Angeletos (2005), this is caused by the differences in perspective between the two regions. Western Europe considers wealth to be a consequence of luck whereas the USA considers it an effect of merit. Moreover, according to the Western European perspective poverty is the cause of locked-in systems whereas the USA perspective considers it the cause of lack of effort and personal decision-making.

The previously described difference is embedded in American society by its belief in the American Dream which causes acceptance of income differences. However, the ethos exaggerates the true economic mobility which is in practice lower than in European nations (Davidai & Gilovich, 2015). The underlying notion behind the American dream has famously been formalized in the promise of upward mobility (POUM) hypothesis. This hypothesis states that people do not favour more redistributive policies as they, or their children, could own large amounts of wealth and then would be hurt by a more redistributive system in the future (Benabou & Ok, 2001). Some of this reasoning is also a consequence of believing in the meritocratic system, i.e., everyone has acquired their wealth by a fair process, and thus it is unfair to ask for redistribution. However, when reviewing the odds of being able to move up the ladder, it is a false belief that those opportunities are a regular occurrence. While the perspective of mobility and POUM is of interest for this thesis, it will be discussed at larger length in Chapter 3: Economic Inequality as it deviates too much from the current topic of democracy. However, to be aware of the problem of the false promise of mobility (and the thus faulty notion of POUM), I highlight a quote from Alan Krueger (2012) during his time as chairman of the Council of Economic Advisers of the White House in 2012.

> *"A reasonable summary is that the correlation between parents' and their children's income is around 0.50. This is remarkably similar to the correlation that Sir Francis Galton found between parents' height and their children's height over 100 years ago. This fact helps to put in context what a correlation of 0.50 implies. The chance of a person who was born to a family in the bottom 10 per cent of the income distribution rising to the top 10 percent as an adult is about the same as the chance that a dad who is 5'6" (1.68m) tall having a*

*son who grows up to be over 6'1" (1.85m) tall. It happens, but not often."* – A.B. Krueger (2012)

However, not only perception of economic inequality is important, but also the perception between social groups in society is important. Lupu & Pontusson (2015) explained this feature to be the cause of 'social affinity'. The theorem states that one will demand change if there is a social affinity between the group which is having negative impacts and the group which is having democratic power. It theorizes that economic inequality increases if the social groups at the bottom of the distribution are having lower social affinity to the middle group. As such, when social groups other than the dominant voting group, which will often involve ethnic minorities and immigrants, are residing in the lower part of the distribution it can cause less demand for redistribution as they experience less 'social affinity'. Thus, to have redistributive democracy one should not only be aware of the economic inequality, but it should also be deemed damaging, and also be damaging to those who the voter cares about, only then actual change will be demanded. As one can see, there are many steps, and there is another one…

### *Trust in the system*

Getting to the point that a voter would desire change is one thing, however, getting this desire into a casted vote is another. Seemingly, this is not a straightforward notion. For example, Kasara & Suryanarayan (2014) found that there is a tendency for the rich to have a higher voter turnout than the poor. While differences do occur per nation, it is a common feature among many countries, as shown in Figure 6. Thus, those who would gain the most from redistribution, are not showing up to the voting polls.

There is some uncertainty as to what the exact cause is of the relative lower voter turnout among the poor. There are various interactions, one of them being that income inequality causes distrust in political institutions and dissatisfaction with democracy (Schäfer, 2012). In Schäfer's view, the increasing social inequality, distrust, and dissatisfaction which is accumulating within the poor population of society, cause a risk for political detachment. Among the poor, it is felt that politics are after self-enrichment rather than preferring benefits to the poor. This has a by-effect that enrolment for social policies is reduced as it is provided by an institute they do not trust.

Newman et al. (2015) provide a similar discourse where the poor are experiencing that the meritocratic system is not functioning as it should. This causes that the poor are feeling that they are being left behind. Consequently, they are feeling less engaged in politics to demand change as they do not trust the governmental system to work properly. This view is also echoed by Solt (2008) who finds that rising inequality causes less political engagement of the poor. According to his narrative, this is caused by the effect that the poor are not experiencing any (positive) effects from their voting behaviour which causes that voting is being experienced as pointless.

The overall consequence of these features is that the rich have increased political power. As such, they have increased opportunities to steer policies in their favour as their share of the votes becomes larger and can limit redistribution policy which strengthens their position (Solt, 2008).

However, there is a lively debate on whether income inequality suppresses voter turnout. Stockemer (2017) performed a meta-analysis using 135 articles, which include various countries for various periods of time, and found a significant negative effect for 54% of the regression models. However, it is difficult to state this to be conclusive as the other 46% showed either no or a positive correlation with inequality. So, while some evidence is apparent for voter suppression, it is far from overwhelmingly conclusive.

While the median voter theorem seems to be compelling, it has many perquisites, e.g., awareness of the inequality, deeming inequality to be bad, considering it a problem to yourself (or social group), and having political engagement. All of these seem to be perquisites to have the redistributive democracy functioning. Interestingly, the last notion, the inefficacy of voting can potentially be caused by the following section, i.e., the unequal power perspective.

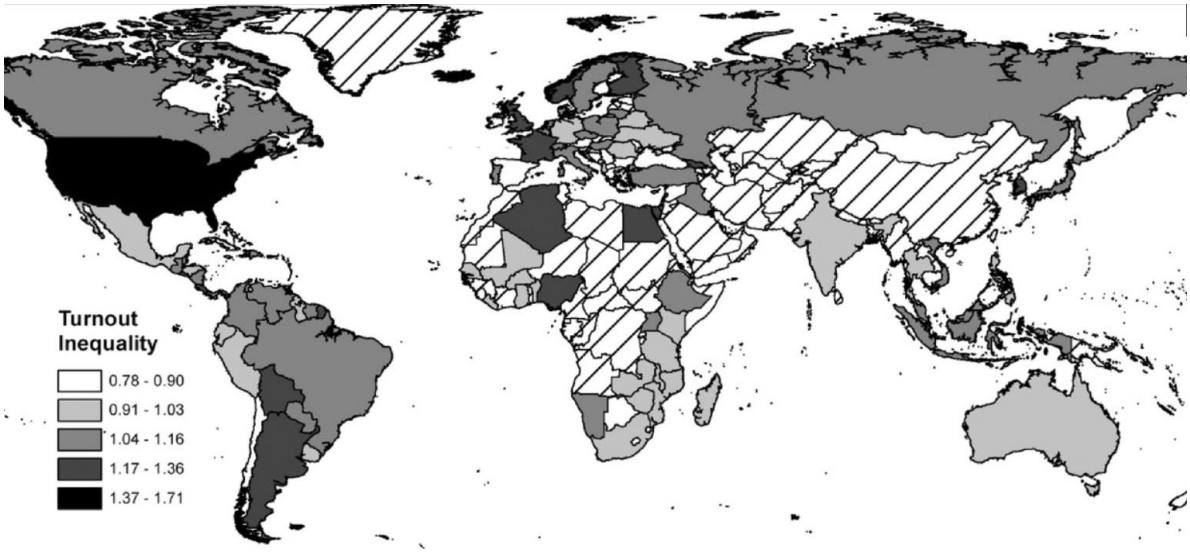


Figure 6 Voter Turn Out Inequality. *Note: Voter turnout ratio between the top and bottom wealth quintile. This figure has been obtained from* **(Kasara & Suryanarayan, 2014)**.

## Unequal power perspective

The unequal power perspective is concerned with the concept that the few can grasp power and use it to their advantage. For this, it is important to understand that there is a difference in political power by *de jure*, i.e., political power by law, and by *de facto*, i.e., political power in practice (Acemoglu & Robinson, 2008). The essence of the unequal power perspective is that one can use financial resources to grasp *de facto* power. Gilens & Page (2014) give an example of this occurrence, showing that in the USA policies that were favoured by the elite, but disfavoured by the greater mass, were still being adopted as policy.

The connection between economic inequality and political power has been formalized in the Bénabou model, i.e., increasing inequality causes the enhancement of the power of the rich and will eventually lead to lower demand for distribution (Newman, Johnston, & Lown, 2015). The reasoning is that with increasing economic inequality, there is more to lose for the rich. Therefore, they have a higher incentive to prevent this from happening. For example, when an attempt is to democratize politics, the rich will invest larger amounts to avoid this from occurring to retain their power position. This

interaction stops when the investments required are outweighing the potential gains from having *de facto* power (Acemoglu & Robinson, 2008).

In this context, Krieger & Meierrieks (2016) reviewed the evidence for 100 countries and show that there is an increasing tendency over the period of 1971-2010 to favour political power in the hands of the rich and they can do so ever-increasingly. In their analysis, there were both democratic and non-democratic countries, but both have the same trend of increasing inequality causing increased power in the hands of the rich. However, democratic nations do experience less power from the rich as opposed to the non-democratic nation, i.e., working as a buffer against de facto power but not preventing the trend.

The process to turn financial resources into *de facto* power seems to occur via five different processes. Using these processes, they can improve their economic power by adjusting policies regarding competition, market regulation, property rights protection, and rule of law in their favour. These processes are (Krieger & Meierrieks, 2016):

*Capturing legal and regulatory institutions:* By buying/bribing officials they can gain advantages on the market inaccessible to the common people.[5]
*Media capture:* By buying the media the rich can control the public narrative and steer opinions toward their favourable agenda.
*Private property rights protection:* After buying protection for their property, they steer lower protection for the greater mass which are not able to afford their protection, thus gaining an advantage in property protection.
*Financing of extra-legal violence:* By supporting (violent) demand, either via hired arms or incited protests and riots, they can steer politics into their desired agenda.
*Shaping policies:* By funding political entities, the rich can demand favourable policies protecting/enhancing their wealth.

It will be beyond this thesis to discuss all these processes in greater depth. Moreover, the processes are difficult to prove as they do not directly connect wealth to power but use intermediate steps to do so. For example, the U.S. Capital riots of January 2021 have famously been connected to Trump who potentially incited a mob to riot to maintain political power. However, how these events connect to economic inequalities is complex and has intermediary steps such as the use of his network with media outlets. Hacker & Pierson (2010) state that it is too simplistic to review the process of inequality one-on-one with political power. From their analysis, it is the system revolving around the winner-takes-it-all that in total steers the connection of wealth to political power in the United States.

While avoiding an in-depth analysis due to the complexity and large review required to explain the interactions, it is of interest to show one of the processes, i.e., shaping policies, as it exemplifies the interaction between wealth and democratic power spot on.

[5] An interesting concept is the Tullock Paradox which explains that the cost of the bribe is much lower than the gains received cause high rate of return. However, paradoxically, the number of people attempting to bribe stays low. The paradox has been introduced by Tullock (1980).

This is aptly explained by Holcombe (2018) when narrating the notion of political capitalism:

> *''Political capitalism [means that] the economic and political elite cooperate for their mutual benefit. The economic elite influences the government's economic policies to use regulation, government spending, and the design of the tax system to maintain their elite status in the economy. The political elite are then supported by the economic elite which helps the political elite maintain their status; an exchange relationship that benefits both the political and economic elite.''* – R.G. Holcombe (2018)

There are indications that financial resources are increasingly more capable of influencing politics. For example, U.S. President Jimmy Carter stated that wealth has become of unparalleled importance after judicial ruling enabled the funding of political parties without financial limitations (Weaver, 2016). The judicial ruling caused a record of financial support given by Wall Street businesses during presidential campaigning in 2016, i.e., 2 billion dollars (Bukhari, 2017). However, four years later, during the presidential campaigns in 2020, this record got blasted again with a record of 2.9 billion being spent by Wall Street businesses. Lisa Donner, the executive director of Americans for Financial Reform made the following statement after this occurrence (Schwartz, 2021):

> *''Year in and year out, this torrent of money gives Wall Street an outsized role in how we are governed while driving and protecting policies that help this industry's super-wealthy amass even greater fortunes at the expense of the rest of us.''* – L. Donner (Schwartz, 2021)

It is difficult to state which perspective is dominant, probably they are operating simultaneously and countering each other's goals. To bring balance, it will be required to optimize the ability of the redistributive democracy to operate properly and to limit the ability of the rich to influence society in their favour. Although economic inequality is on a rise, the democratic route will certainly not be the only route through which the rich can gain advantages. However, it can quite rightly be that democracy requires a new perspective.

> *''The struggle is no longer about the right to vote but about the organization of politics. … Nonvoting is related to the contradiction, embedded in the political system, between (1) the movement to universalize suffrage and (2) the attempt to make the vote meaningless. We get confused because we assume the fight for democracy was won a long time ago. We would find it easier to understand what is going on if we assumed that the battle for democracy is still going on but has now assumed a new form.''* – E.E. Schattschneider (1960, p. 100)

## 1.3 Education

Education is often seen as the solution to economic inequality and is portrayed as "the great equalizer". Because of education, everybody has the potential to invest in their human capital and transform that into financial resources. However, there have been indications that economic inequality is influencing education as found by Killewald et al.

(2017). However, the aspiration that education is the solution to the problems has been aptly narrated by Wilby (1977):

> *"No other induced social change has attracted quite the same degree of liberal enthusiasm and faith and vision … educational equality was an attempt to achieve social change by proxy. More and better education was more politically palatable and less socially disruptive than direct measures of tackling inequality. So was economic growth. Even the most complacently privileged could hardly object to children attending better schools and to the nation producing more wealth. Equality of educational opportunity had an altogether more agreeable ring to it than any other form of equality, such as equality of income or equality of property. With its overtones of self-improvement, it could even appeal to the more conservative elements in society. Its beauty was that, while many must gain, it did not imply that any must lose …. Education was a cornucopia, so prolific of good things that nobody would need any longer to ask awkward questions about who got what."* – P. Wilby (1977, p. 358)

The fact that education is not "the great equalizer" seems to be exemplified by the fact that economic inequality has been increasing since the 1980s while there was a high increase in educational level obtainment (Domina, Penner, & Penner, 2017), as shown in Figure 7. As such, it seems baffling that while education became intensified, the envisioned great equalizing effects have not come into effect. This trend of increased education and increased inequality is not only occurring in the USA but worldwide, as shown in Figure 8. The number of tertiary students increased by a relative factor (accounting for the growth of the total population) of 3.17 between 1970 and 2013 (Marginson, 2016).

In this section, I will attempt to unravel how economic inequality is hampering the equalizing effects of education. Two broad explanations can be synthesized for this

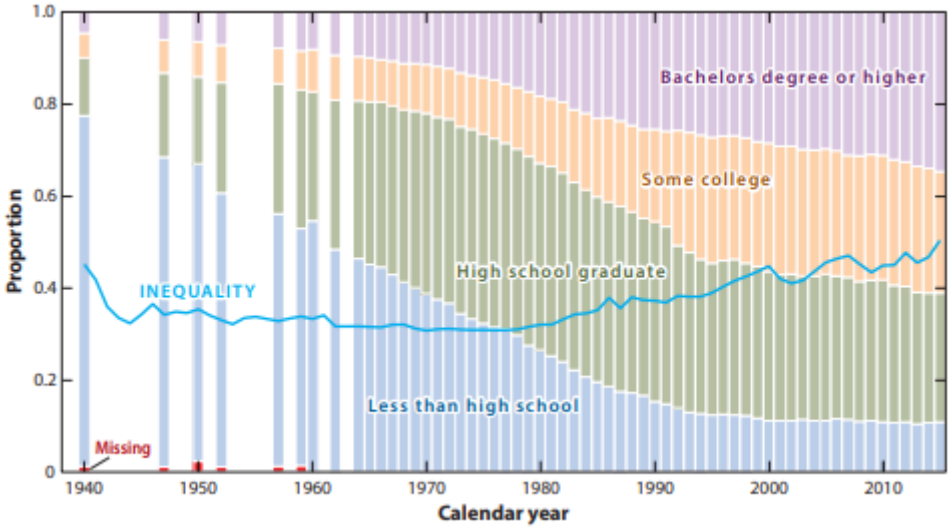


Figure 7 Progression of income inequality and educational attainment. *Note: Trend of income inequality and educational attainment within the US between 1940-2014. Data on educational attainment is obtained from people older than 25 via the Current Population Survey. Income inequality is visualized by the income share of the top 10% of earners. This figure has been obtained from* (Domina, Penner, & Penner, 2017).

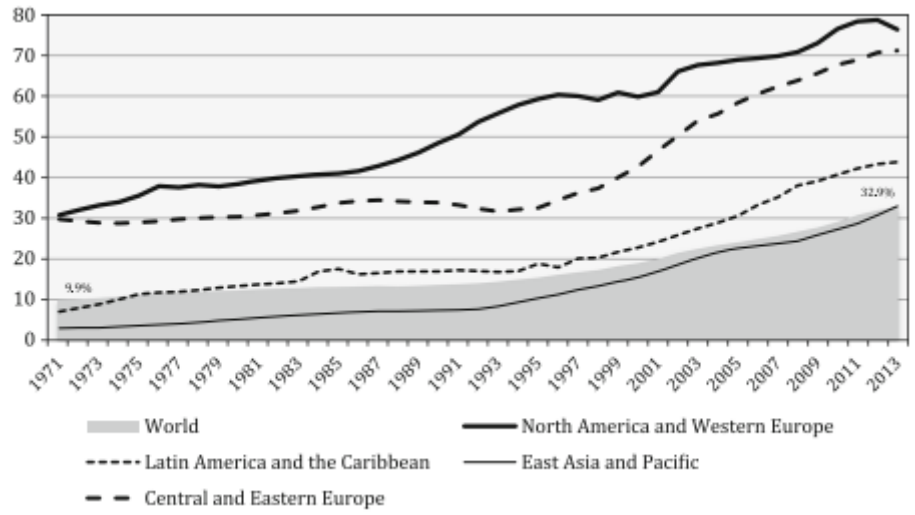


Figure 8 Growth in the number of students in tertiary schooling. *Note: Data has been acquired from UNESCO in 2015 and represent tertiary education enrolment between 1971-2013. This figure has been obtained from* **(Marginson, 2016)**.

occurrence. At first, there seems to be a system where the poor are unable to escape their positions while the rich are protecting their positions from entry (Brown P. , 2013). Secondly, there seems to be a trend of diverging income between the different educational layers (Donovan & Bradley, 2020), as shown in Figure 9. While more people are obtaining tertiary education, it is only their income that has risen in the past decades whereas the lower educational layers have seen a deterioration in their income. This narrative will be explained in the section *Income Inequality* in chapter 3. However, the combination of the first notion, fixed socioeconomic positions, and the second notion, increasing income difference between socioeconomic positions, seem to be potent at aggravating income inequality across generations.

When discussing education, one quickly encounters the terms absolute mobility, i.e., the increase in income/wealth, and relative mobility, i.e., the increase in income/wealth compared to someone else (Cole, 2014). Without going into too much depth into mobility (as it will be discussed in Chapter 3: Economic Inequality more extensively), the relation to education occurs due to the educational level being a great marker for future obtained socioeconomic position. Thus, when being able to discern which opportunities the different socioeconomic layers have to obtain various educational levels, one can describe whether education can cause personal growth to obtain a higher position, i.e., mobility.

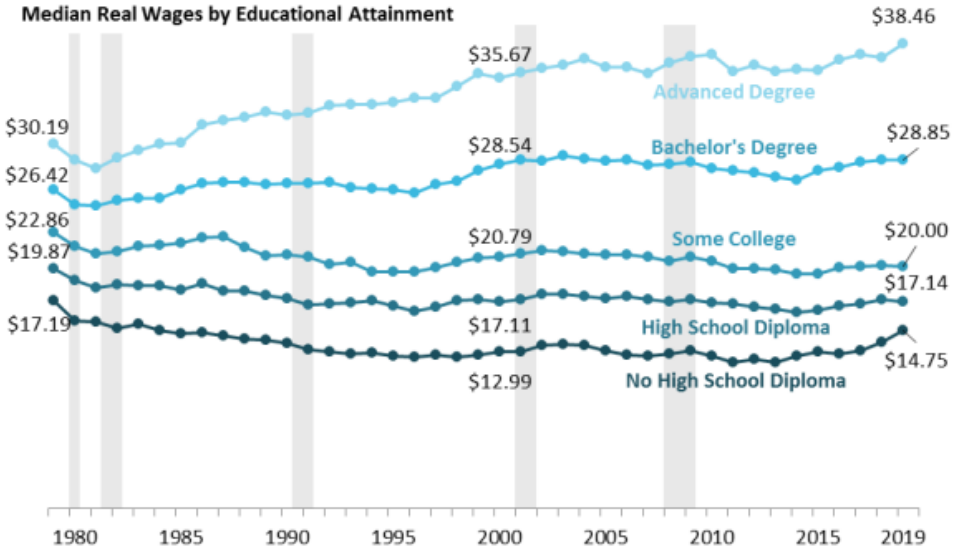


**Figure 9 Median real wages by educational attainment within the US.** *Note: The results are based upon data from the Current Population Survey Outgoing Rotation Group for the period 1979-2019. The results for the areas shaded in grey (recession periods) are based upon data from the National Bureau of Economic Research. Results are calculated using non-farm wage and salary of workers between 25-64 years old (when hourly wage could be computed). The dollar values are adjusted for inflation using the CPI-U using 2019 as a benchmark. This figure has been obtained from* **(Donovan & Bradley, 2020)**

## Social congestion

The inability of education to create mobility is mediated through the process of social congestion, i.e., oversaturation of a socioeconomic layer. Within education, this occurs through the inflation of education caused by the increase in the number of people obtaining diplomas without the market having enough demand to keep up with the increase. In essence, when everybody gains higher educational diplomas no one gets ahead, it simply increases competition causing increased requirements to obtain a position.

In the process of social congestion, the higher social classes have advantages over the new entrants and can retain their positions (Collins R. , 2019). This is caused by the fact that when a tertiary diploma is no longer enough to obtain a high position, soft skills are included to differentiate between applicants. However, these soft skills are not unbiased as they correlate with the socioeconomic background using networks to gain an advantage (Michaels, Handfield-Jones, & Axelrod, 2001). As such, higher social strata can keep their high socioeconomic positions within their spheres (blocking relative mobility) and new entrants only occur during economic expansions, i.e., when new high socioeconomic positions are created (Brown P. , 2013).

The increased competition among the tertiary graduates within the labour market has two effects (Figueiredo, Biscaia, Rocha, & Teixeira, 2015): 1. Lower wages at the bottom of tertiary graduates, and 2. Increased wages at the top of the tertiary students. The latter effect occurs as companies are attempting to find top-tier talent in the mass of graduates and bind them to their company. In this process, they give large pay-outs to these top talents to both stimulate applicants to perform, but also to bind them to their company (Wooldridge, 2006). This steers the whole process into a superstar labour market where income and performance are not keeping track of each other, as described by Rosen

(1981). In essence, the spur of higher education is reducing the income for the mass of the graduates but spurring the income of the few, economic inequality in the end.

### The great sorting machine

While social congestion mainly occurs in tertiary education, which is increasing globally, Domina et al. (2017) show that the educational system has a far wider implication. Their general notion is that education is performing as "the great sorting machine" causing (social) inequality by its categorizing structure. They explain that students are being filtered among grades, educational interests, regions, parents' preferences, and other elements. Education causes groups to be categorized into groups that hamper their development. As an example, the difference between a high school drop-out and a graduate has an immense impact on the ability to obtain a job because of being labelled as being one or the other.

The interaction between social class and outcome in education has been analysed by Manstead (2018). The basic notion is that the (perceived) social class causes a direct effect on the education obtained. The likelihood for the lower-class population to obtain higher education is decreased by traits associated with their class. Important for this is that the class structure is dependent on material conditions, in which economic inequality plays an important role. As such, social and economic mobility is hampered by economic inequality itself (Manstead, 2018). This is conceptualized in the model he proposed in his article, shown in Figure 10. Also, Stephens et al. (2014) describe that social class structures impact behaviour and thinking causing the perpetuation of inequality within societies. These effects do only occur within the education field, but also in homes and workplaces. As for this thesis, financial advantages can specifically be translated into educational advantages through: 1. granting access to higher quality education, and 2. by being able to increase educational performance.

The first notion can be exemplified by the situation in the USA where elite Ivy League universities with high tuition fees, occupied by the elite of society (64% of students are coming from families in the highest income decile), which in turn offers elite positions at firms (Marginson, 2016). The relation between income and quality of education has also

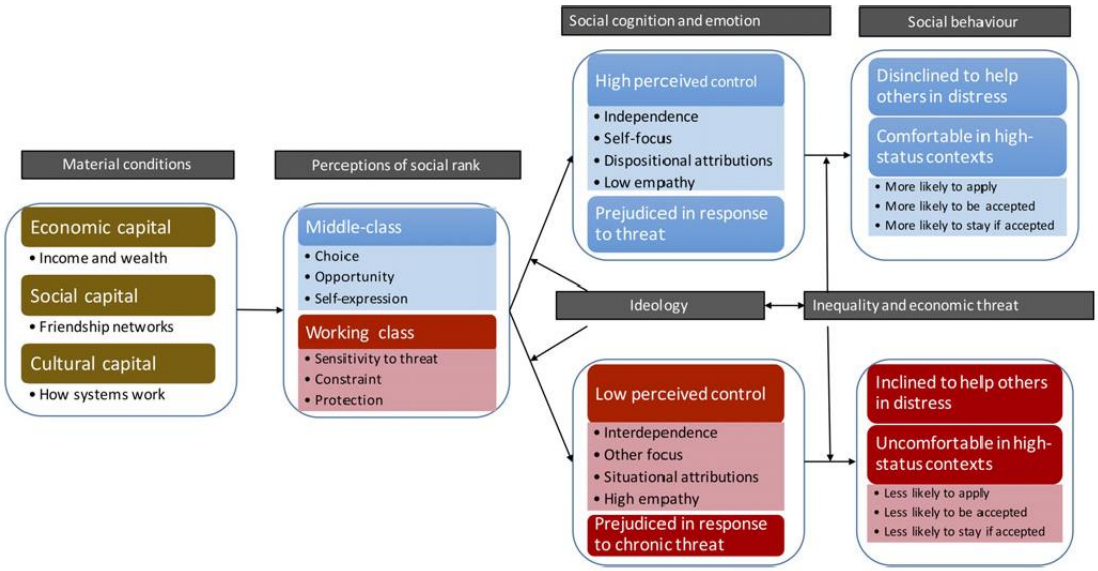


Figure 10 Model providing interaction between material conditions and social outcomes. *Note: This figure has been obtained from* **(Manstead, 2018)**.

been analysed by Chetty et al. (2014), as is shown in Figure 11. This process seems to be persistent as it also has been reported 10 years earlier by Haveman (2006) but also various nations altogether (Jerrim, Chmielewski, & Parker, 2015; Neves, Ferraz, & Nata, 2017).

The second notion revolves around financial resources being able to increase educational performance. Mostly, this is connected to shadow education which offers the opportunity to obtain higher test scores in return for a financial fee (Buchmann, Condron, & Roscigno, 2010). Problematic to this process is that society is increasingly obsessed with using test scores to differentiate between individuals while high results can be bought. Au (2016) shows that these forms of testing are biased toward social constructs and instead of breaking inequalities are making them stronger.

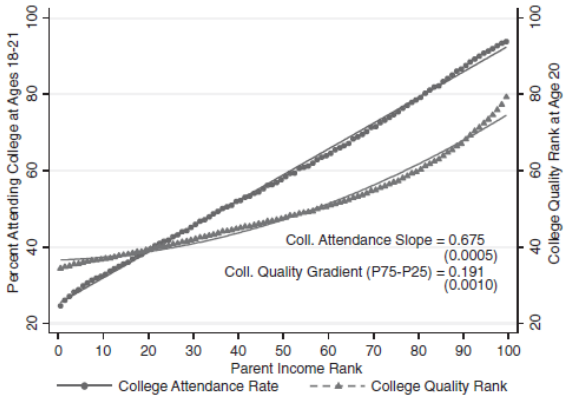


Figure 11 Interaction between college enrolment and parental income. *Note: Parent's income shows (almost) linear correlation with college enrolment, but non-linear with enrolment to (high) quality colleges. This figure has been obtained from* **(Chetty, Hendren, Kline, & Saez, 2014)**.

While direct financial gains are effective in gaining a favourable position, it is also the socioeconomic position that is aiding in the process. When enrolling for an academic study, students who have parents who obtained an academic study have a knowledge advantage about specific parameters which improves their chances to be enrolled. But also, the notion of categorical differences creates an incentive to alter the valuation of students' work. The mere notion of a student with educated parents being categorized as gifted caused that the teacher evaluated their work more positively (Domina, Penner, & Penner, 2017).

The previous example is caused by the social network, but also geographical advantages are gained. Owens (2018) found that there is a significant discrepancy in educational attainment by geographical differences. Schools that were placed in rich zones were significantly outperforming schools in poor zones. The idea behind the relation was that schools in rich zones have more financial funding from their enrolled students by which they could provide higher quality schooling. As such, economic inequalities are transformed into geographical segregation causing advantages by location.

### Being left behind

Rodríguez-Posez, (2018) found that lagging areas obtain a sense of being "places that don't matter" causing and encouraging them to think in territorial lines, i.e., the various regions will strive for their own best interest. In line with this process, Lamont (2018) shows that notions occur of "why try", i.e., reduced ambition in life goals as they feel locked into their social strata. In her view, it is not so much the inequalities per se that need to be tackled but the stigmas that need to be abolished that can be achieved by reviewing how people reflect on their reality of living and breaking harmful constructs. Both Lamont and Rodríguez-Posez bring the notion that focus should be put on the less fortunate, respectively through reducing stigmatization and developing policies for the "places that don't matter".

Problematic to the current educational system, and more precisely in determining outcomes, is that the lower classes are becoming entrapped in their system (Lloyd & Mayhew, 2010; Roberts S. , 2012). There is a large volume of uneducated work which does not require any type of schooling, nor is schooling provided by these companies as there is a lack of necessity. Moreover, the investment costs for education are higher than simply hiring an employee with an adequate education level. From this, there are two lessons to be learned. The first one is that schooling should occur in the social sector as the benefits are incurred by society and not by private companies individually. The second is that low-skilled jobs are amply being trained by private companies, as such there is a governmental strategy required to avoid the entrapment of people working in the low-skilled sector (Lloyd & Mayhew, 2010; Roberts S. , 2012).

Overall, the story coincides with Torche (2011) who found a U-shaped pattern in the stratification in education. Both in the lower and upper echelons of education the enrolment and outcome were correlated with parental background whereas education in the middle experienced mobility to move up and downward. This fits the narrative where the low socioeconomic background is being locked into their position and the high socioeconomic positions can guard their position.

At the low end of socioeconomic, immobility seems to be in close relation to the fact that these socioeconomic positions seem to be bundled in the retail, catering, and care sector (Devins, Bickerstaffe, Mitchell, & Halliday, 2014). These industries have notably low educational requirements, high employee turnover, and give limited opportunities to gain educational progression. In a sense, they are jobs with the means to supply income but are not part of a progression in a career perspective. Also, from an employer's perspective, the incentive to invest in the employees is low as the high turnover causes low odds of gaining a return on the investment. Moreover, the high turnover also causes high costs to employers. It is estimated that the high turnover causes £4000,- per recruited employee. Problematic to these notions is that the number of jobs in the sectors is abundant, close to a quarter of the labour force in the UK are employed in these sectors, and their abundance is ever-growing. As such, there is large potency to create polarization in the job market dividing low-income, low-skill jobs from high-income, high-skill jobs (Devins, Bickerstaffe, Mitchell, & Halliday, 2014).

However, Chowdry et al. (2013) state that the guarding of high socioeconomic position towards the entry of high educational positions is only mildly occurring with the step going from high school towards university. The problem occurs at an earlier stage of the educational process as individuals in low socioeconomic positions are already not able to get into a position of being able to apply to universities. For example, they have significantly more issues with performing in secondary school. Thus, removing barriers between secondary and tertiary schools will not solve the bias toward high socioeconomic positions, the stratification already occurs earlier in life.

### A "new" perspective

The importance of education for the development of human capital is shown by the research of Knudsen et al. (2006). They state that the return on investment of education is highest at a young age and decreases over time. Their general theorem is based on the belief that "skill begets skill" and an early start leads to a higher compounding effect of the obtainment of human capital, conceptually represented by Figure 12. It has been found that the Perry pre-school program had 12,90 dollars return per dollar invested (Schweinhart, et al., 2011), or put differently the pre-school program has a rate of return of approximately 19%, outcompeting average stock market equity by a wide margin (Knudsen, Heckman, Cameron, & Shonkoff, 2006). However, it should be noted that 88% of these returns are connected to reduced crime rates, excluding these effects, the return rate would be 1,59 dollars return per dollar invested, a much small return rate. To test the compounding effect of the pre-school program, Knudsen et al. (2006) reviewed a study comparing children who received a pre-school program and those who did not. They showed that significant improvements were made in the educational and economic outcomes, as shown in Figure 13, exemplifying the beneficiary effect of investing in human capital at an early stage of life.

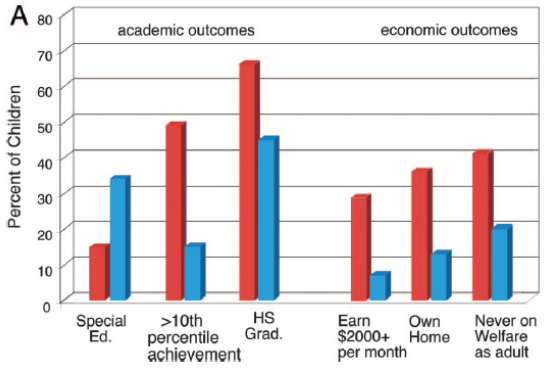


Figure 13 Effects of pre-schooling. *Note: Red bars indicate Perry Preschool intervention, blue bars control group. Data was obtained when individuals were 27 years old. >10th percentile achievement are students who tested above the lowest 10% on California Achievement Test. HS Grad are students who graduated from high school in nominal time. This figure has been obtained from* **(Knudsen, Heckman, Cameron, & Shonkoff, 2006)**.

However, Keep & Mayhew (2014) note that while improving the education of the poor is essential, it should not be focussed upon as being the solution to social mobility. Instead, the system should focus on the entrapment of the low-wage population being unable to escape their position. Providing them with more opportunities to climb the socioeconomic ladder would prove to be more beneficial to socioeconomic mobility and the economy as a whole (Keep & Mayhew, 2014). Overall, this has been conceptualized by Brown (2013) who shows the relation between social congestion and social stratification, with absolute and relative mobility, as shown in Figure 14. If it is desired to have more relative mobility, then social stratification should be avoided which cannot be done by solely focusing on education.

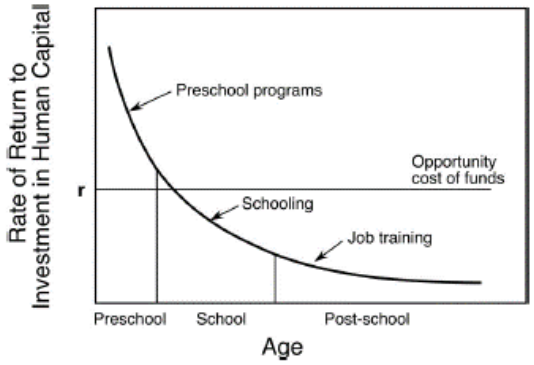


Figure 12 Rate of return on human investment as a function of age. *Note: Graph has been modelled using the life cycle model and dynamic human capital accumulation using various constraints. Investments were set equal across all ages. This figure has been obtained from* **(Knudsen, Heckman, Cameron, & Shonkoff, 2006)**.

This is also voiced by Berliner (2013) who states the idea that educational reforms to improve quality can only be done in combination with economic and social reforms. In his rhetoric, the out-school parameters are causing three times

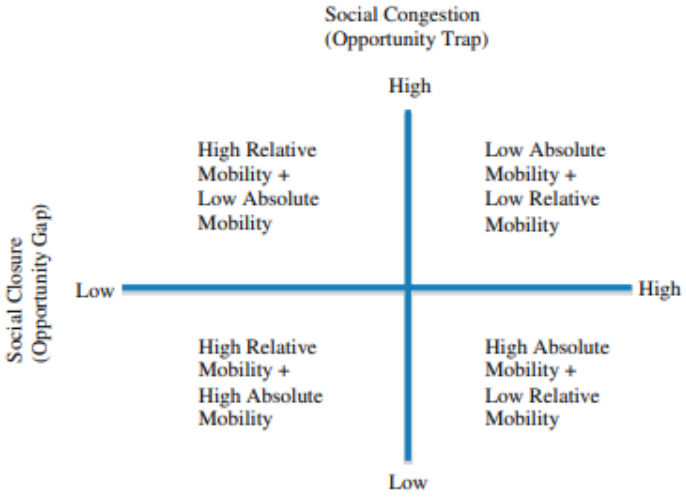


Figure 14 Potential for relative and absolute mobility. *Note: Social closure and congestion interact with the two different types of mobility. This results in various potentials of mobility depending on the societal system. This figure has been obtained from* (Brown P. , 2013).

more of an effect on school performance when compared to in-school parameters. He mostly points at poverty being a common denominator for unequal educational outcomes. This results in his following strong statement (Berliner, 2013):

> *"My point is that citizens calling for school reform without thinking about economic and `social reforms are probably being foolish. The likelihood of affecting school achievement positively is more likely to be found in economic and social reforms, … More than educational policies are needed to improve education."* – D.C. Berliner (Berliner, 2013)

## 1.4 Economy

Having reviewed the effects of economic inequality on health, democracy, and education, the question arises of how it affects the economy. Frequently, the state of the economy is marked by its GDP per capita and economic growth.[6] However, it is difficult to decipher the exact method of interaction due to the complexity of economies. As Stiglitz (2016) mentions, it is difficult to explain how it can be that Western countries, which have similar technology, GDP, and productivity, but do have large differences in their (before-tax) inequality. He states that it is simply not possible to bring forth a general theory that can genuinely explain how economic inequality interacts with the economy.

When reviewing how economic inequality interacts with the economy, one finds four distinct interactions (Went, 2014): 1. Lack of consumption due to insufficient income, 2. Increased burden of private debt causing reduced consumption, 3. The capture of politics by the rich favouring their position, and 4. Reduced investments into human capital reduce productivity. For this thesis, I will discuss the two general notions involved in these interactions: 1. Productivity, and 2. Consumption. The effects of political features

[6] The growth in GDP can be distinguished into intensive and extensive growth. For the scope of this thesis I will only review the effect of inequality on intensive growth

have been explained earlier in section 1.2 and the influence of investments (read finance) will be reviewed in chapter 3.

> *"A more egalitarian income distribution is not luxury that can be dealt with once the economy has been stabilized; it is an integral part of a sound macroeconomic structure"* – Stockhammer (2012)

### Productivity

It is hypothesized that economic inequality causes reduced productivity because of reduced investments in human capital. The idea is that human capital is needed to use technology and improve work efficiency, i.e., factors that improve productivity. This interaction has been formalized in the Galor-Zeira model (Galor & Zeira, 1993). This vision has been supported by Cingano (2014) finding that economic inequality caused hampering economic growth, as shown in Figure 15. According to Cingano this mainly occurs through setbacks among the poor not gaining the ability to gain education and having fewer options in the labour market. This story resonates with the statements made in the section on education, there is stratification in the lower and higher classes, and apparently, the stratification causes inefficiencies in the market.

However, it has been shown by Cohn et al. (2015) that economic inequality also causes direct inefficiency in productivity. They show that this is mediated by the underperformance of labourers who find their salary to be underpaid. A wage increase would only increase productivity when they felt that they were being underpaid, those who felt being paid adequately or even being overpaid had no benefits of increased payment. Moreover, if an employee receives a wage cut of 25% his working performance drops by 38% while if they both receive a wage cut their performance reduces by 15%. Moreover, they show that the employee with a single wage cut performed more employee theft and was more dissatisfied with his work compared to the group of employees who received the same wage cut (Cohn, Fehr, Herrmann, & Schneider, 2014). As such, rising inequality can cause employees to experience unfairness in pay-out and reduce productivity.

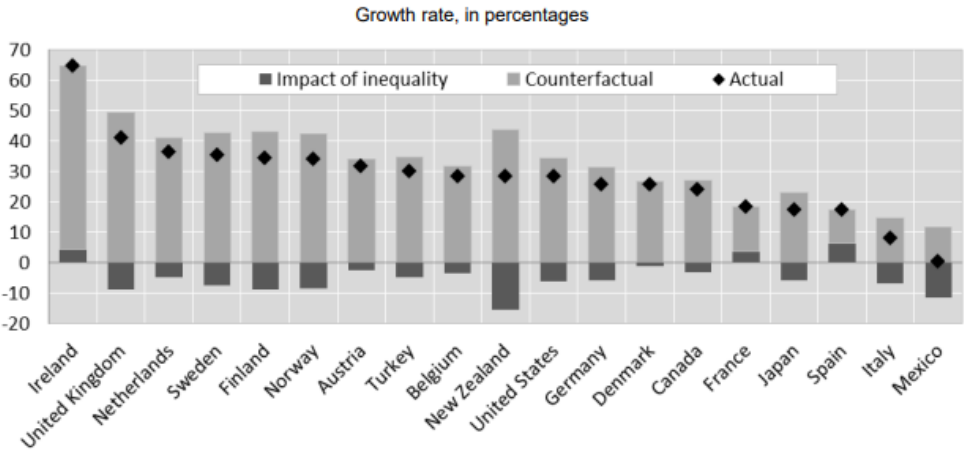


Figure 15 Effect of inequality on economic growth for OECD countries between 1990-2010. *Note: Chart shows the estimated effect of changes in inequality observed between 1985-2005 on the cumulative GDP per capita growth rate over the period of 1990-2010. Counterfactual is the difference between actual and the effects of inequality. This figure has been obtained from* (Cingano, 2014).

## Consumption

The other negative causation of economic inequality runs through a change in consumption caused by rent-seeking behaviour leading to reduced economic growth (Stiglitz, 2016). The method of interaction is that rent-seeking behaviour causes investments into assets that do not cause a gain in GDP. This is not only limited to the very wealthy investing in financial assets but also the 'common' civilian diverting investments into real estate. The common denominator to these assets is that they do not create added value to the economy. Moreover, rent-seeking behaviour in finance and real estate do not experience diminishing returns on their rate of return on investment. As such, it is a broken link with the potential to cause large damage to the economy (Stiglitz, 2016).

Not only rent-seeking behaviour is an issue, but also the consumption differences correlated to financial resources impact the economy. Fisher et al. (2020) show that the propensity to consume a dollar is negatively correlated to increasing financial resources, as shown in Figure 16. For example, the highest income quintile consumes less than half of their income while the lowest quintile consumes more than 95%. As such, an increase in inequality that removes 1 dollar from the lowest income quintile would cause a decrease of 0.976 dollars of consumption, but would only increase by 0.435 dollars of consumption when given to the highest income quintile. In essence, one loses more than 50% in consumption for every transferred dollar from the poor to the rich.

The more direct link of consumption to income, as opposed to wealth, can be illustrated by the concept of living 'hand-to-mouth' (Kaplan, Violante, & Weidner, 2014). The concept of 'hand-to-mouth' is that those individuals experience a high propensity to consume, i.e., they consume almost every dollar they have gained in wealth. When reviewing the amount of wealth owned, one finds that there is a considerable portion of wealth owners who are still living 'hand-to-mouth' as their wealth is invested in illiquid funds causing inaccessibility for consumption when needed. In most nations, the proportion of wealth owners living 'hand-to-mouth' exceeds more than 50%, but up to 90% is certainly not unique (Kaplan, Violante, & Weidner, 2014), as shown in Figure 17.

The difference in the propensity to consume can allow using redistribution as a tool to improve economic growth instead of using a trickling-down economy (Cingano, 2014). The largest benefits can be made by improving the economic possibilities of the low-income, i.e., the lowest 40%, and not solely focusing on the poorest 10%. Fisher et al. (2020) have a similar finding showing that a transfer of wealth from the top 20% to the bottom 80% would increase aggregate consumption. They calculate that a transfer of 1 billion dollars from top to bottom would increase aggregate consumption by 1.232 billion dollars.

| | Income | | Wealth | |
|---|---|---|---|---|
| | **1999** | **2013** | **1999** | **2013** |
| Q1 | 0.976 | 0.974 | 0.654 | 0.744 |
| Q2 | 0.680 | 0.741 | 0.583 | 0.658 |
| Q3 | 0.561 | 0.629 | 0.564 | 0.590 |
| Q4 | 0.518 | 0.542 | 0.555 | 0.607 |
| Q5 | 0.435 | 0.475 | 0.582 | 0.607 |

Figure 16 Average propensity to consume according to income and wealth. *Note: Figure represents propensity to consume per income and wealth quintile in the years 1999 and 2013 according to calculations performed by the article's authors using data from the Panel Study of Income Dynamics. This figure has been obtained from* **(Fisher, Johnson, Smeeding, & Thompson, 2020).**

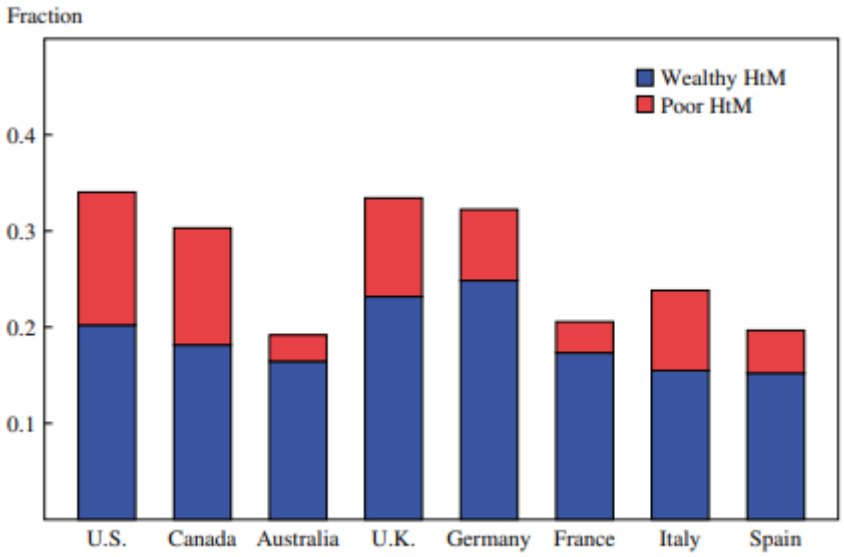


Figure 17 The relative presence of (wealthy/poor) 'hand-to-mouth' population compared to the total. *Note: Results come from calculations of the article's authors using (various) national and euro area survey series. This figure has been obtained from* **(Kaplan, Violante, & Weidner, 2014)**.

As such, they view the reduction of economic inequality as a tool to increase aggregate demand and improve the economy.

While the main narrative is that economic inequality has a negative impact on economic growth, some theories challenge that general statement. For example, Bruckner & Lederman (2015) and Madsen et al. (2018) find that economic inequality has a positive effect on growth for developing countries while it has a negative effect on developed countries. However, the whole premise of inequality affecting economic growth is doubted by Breunig & Majeed (2020) who state that inequality and economic growth primarily interact in countries that experience high rates of poverty. As such, one should not implement policies against economic inequality but against poverty. Moreover, even when accepting that economic inequality causes stunted economic growth, redistribution does not automatically cause improvements. Berg et al. (2018) show that redistribution is only effective up to a limited size of redistribution, i.e., it fails to have a positive impact on growth when more than 13 Gini points reduction from market income to disposable income is being achieved, as shown in Figure 18. This view that redistribution should not be too large gives reason to believe that pre-tax inequality cannot indefinitely be redistributed to adhere to "fair" distribution post-tax. The pre-tax distributions should already have a form of equality. Overall, there are indications that economic inequality and the economy are interacting. However, the exact interaction can be debated and will be out of the scope of this thesis to be reviewed.

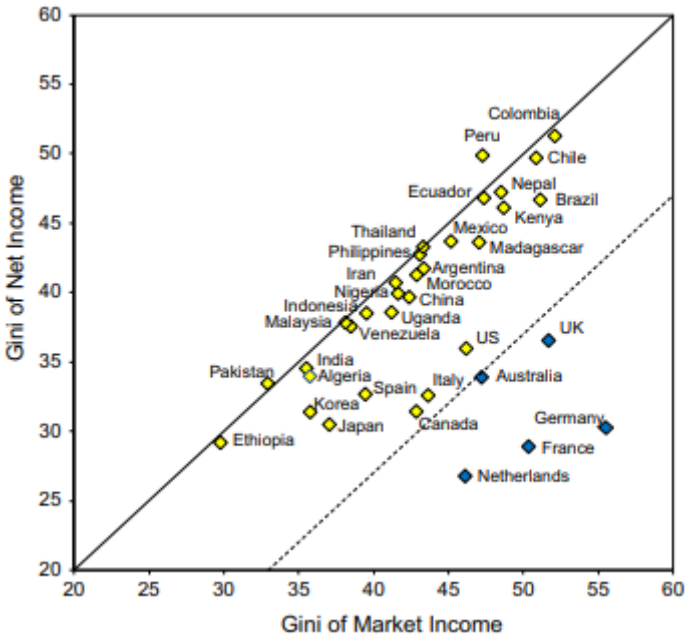


Figure 18 Redistribution of income for various countries. *Note: Size of redistribution according to the change in Gini coefficient from market income (pre-tax) to net income (post-tax) where the botted line represents a shift by redistribution of 13 Gini points. Results have been obtained by the article's authors' calculations. This figure has been obtained from* **(Berg, Ostry, Tsangarides, & Yakhshilikov, 2018)**.

### Type of Economy

The effects of redistribution do not only affect the distribution, but it also affects the economic functioning. In this regard, one finds that one can distinguish countries between wage-led or profit-led economies. A wage-led economy focuses on the perspective that increases in overall wages cause larger consumption/demand and, as such, are beneficial to the economy. A profit-led economy focuses on improving profits to motivate entities to improve productivity to gain more profits. As such, redistribution policy would direct society toward a wage-led economy while less redistribution would direct toward a profit-led economy (Palley, 2017).

These effects are also found by Onaran & Galanis (2012) showing that the reduced wage shares after the 1980s caused inhibited economic growth in wage-led economies as it was counter-effective to those types of economies. In a general sense, they advocate that to enforce economic growth it would be favourable to focus on wages as the global economy proves to be wage-led. Moreover, it has been stated that a profit-led economy is more fragile to economic shocks as profits gained and investments done are sensitive to economic status. In a down-turning economy, risks of investments are often avoided causing hampering of the economy which contrasts with wage-led economies which prove to be more stable.

In the works of Storm & Naastepad (2013), they review the topic of a wage-led or profit-led economy. Their view is that for both types of economies a wage reduction is a counter-productive policy to obtain economic growth. As such, de-unionization and deregulation of the labour market are ill-advised. However, they do note that simply

increasing wages as a single policy is also not the way forward. They advise combining these steps with three other notions:

1. A fair sharing of the gains of labour productivity growth between business and labour.
2. an allowance for high enough profits to stimulate investment.
3. A commitment to providing employment security both at the level of the firm and as a (full employment) macroeconomic strategy.

As a (last) example to show how the type of economy affects inequality, Carvalho & Rezai (2016) found that being either wage-led or profit-led interacts with the tendency to create savings. In a profit-led economy, there is a higher tendency to save as it creates an opportunity to perform investments (a consequence of the Kalencki-Steindl model). This interaction causes that higher redistribution causes a tendency to become a more wage-led economy and in turn creates higher consumption but a lower propensity to invest. As such, one could theorize that higher inequality diverts economies from being wage-led toward profit-led economies. This has also been shown by Oyvat et al. (2020).

I will stop the analysis of the types of economies at this point as it is at the edge of this thesis. However, it is important to note that redistribution will not only affect economic inequality, it can potentially also affect economic functioning entirely. As such, it should not be underestimated how the effects of redistribution can have far more drastic consequences. How such a change will affect economic inequality and the conceptual framework is (for myself) yet to become known at a later stage.

## 1.5 Chapter conclusion

The dimensions of health, democracy, education, and economy have been reviewed in their relation to economic inequality. In general, it has been found that with increasing economic inequality the rich gains advantages and the poor incur disadvantages, and society is becoming stratified more strongly. However, economic inequality as a wicked problem does not have a hierarchical structure of leading causation with respect to the problem. As encountered, interactions can be bidirectional with varying outcomes. Moreover, the issue is faced that economic inequality studies are empirical, and their conclusion are using inductive reasoning. This causes that the interactions cannot be interpreted as definitive results but are the presentation of current occurrences (Henderson, 2020).[7]

As a closing statement, parameters are found to be intertwined in their influence on economic inequality. Society should, therefore, avoid looking for a "silver bullet" to solve the issue of economic inequality. It would be best to not review economic inequality as a single fight, but as a continuous war that requires a refined strategy to have a chance of success.

[7]David Hume famously elaborated on inductive reasoning and explains that empirical observations are a demonstration of something being true for that specific measurement, but it cannot be extrapolated to other situations (Henderson, 2020). For further explanation I would like to refer to David Hume's work, with famous writings in *A Treatise of Human Nature*.

### Conceptual model's building blocks

To complete the analysis for this chapter, the following 'building blocks' have been synthesized for the conceptual model.

## Health

*a. Health – Financial Resources*

Because of the lack of financial resources, health-related goods & services cannot be bought causing negative impacts on the poor.

*b. Health – Stratification*

Because of stratification, the lower strata are negatively impacted caused by compiling characteristics within the strata.

*c. Health – Opportunity Inequality*

Individuals with health-related issues (primarily the poor) have reduced odds in the labour market to acquire work.

## Democracy

*a. Democratic power – Stratification*

Because of economic immobility stratification occurs causing the possibility for the richest to ascertain their political dominance.

*b. Democratic power – Financial Resources*

Because of economic inequality, the rich can turn economic power into democratic power.

*c. Democratic power – Policy Approval*

Because of democratic power, the rich can favour policy adoption which is in their interest.

*d. Democratic power – Unawareness*

Because of unawareness of the inequality occurring in society voting is not occurring which favours redistribution.

*e. Democratic power – Public Perception*

Because of the public perception, the demands for change in economic inequality can differ as its qualities can be reviewed differently.

*f. Democratic power – Disconnection*

Because of mistrust and disinterest in the political arena, the poor are voting less causing lower democratic power.

*g. Stratification – Public Perception*

Because of stratification, the perception of economic inequality can differ as its impact is felt differently.

## Education

*a) Education – Stratification*

Because of stratification, the potential to gain certain educational outcomes is being prespecified.

*b) Education – Income Inequality*

Because of education, the opportunities to gain certain positions in the job markets are prespecified.

*c) Education – Opportunity Inequality*

Because of economic inequality, people (rich) can gain advantages in educational outcomes.

*d) Education – Mobility*

Education increases mobility and can lift people out of their parents' class.

*e) Opportunity Inequality – Financial Resource*

Because of financial resources, it is possible to buy improved educational outcomes causing opportunity inequality.

*f) Opportunity Inequality – Stratification*

Because of stratification, soft skills and social networks differ leading to opportunity inequality.

## Economy

*d. Financial Resources – Economic Growth*

Because the lower portion of the distribution is lacking financial resources to buy goods and services, the economic growth gets hindered due to a loss in demand.

# 2. Quantifying inequality – How to define inequality?

The media shows frequent articles about worsening wealth and income inequality. For example, the New York Times publishes almost daily an article relating to the topic of Income Inequality (The New York Times, sd). A small portion of wealthy people is being called the super-rich (Jones O. , 2022) or the top 0.01% (Gold, 2017), which is contrasted with reports on severe poverty. In a recent news article, it has been described that 100 million fell into poverty in 2021 while the top 0.01% gained 10% in wealth (Reuters, 2021). However, while these claims are made, how can it be known that inequality is growing? How are inequality and poverty being measured? And how can inequality be compared, in both temporal and geographical notions?

In this chapter, I will attempt to answer such questions in two separate sections. The first section will discuss how data concerning economic inequality can be collected in general. The second section will discuss how economic inequality can be quantified to be used for analysis. After these two sections, notions important to the conceptual framework will be summarized.

## 2.1 Data collection

Data is needed to be able to review economic inequality and perform analysis. However, datasets often have limitations in their manner of data collection. Before interpreting data outcomes, it is vital to know which data source is being used and what the limitations of the data sources are. With regard to economic inequality, it can be established that three types of datasets are commonly used (Alvaredo, Atkinson, & Morelli, 2016): .1 Tax data, 2. Household surveys, and 3. List of large wealth owners.

While the separate data collection methods will be discussed in each section, it should be noted that some general aspects can complicate analysis regarding economic inequality. I will discuss the following set of remarks, but these are potentially non-exhaustive as I have not been able to find an article that provided a complete overview of issues: 1. purchasing power parity and, 2. undocumented wealth and income, 3. Life-cycle effects

### *Purchasing power parity*

The monetary value of a single dollar is not the same in each country. While one can use the official exchange rates to convert between different currencies, the official exchange rates do not represent the differences in the purchasing power of these currencies. A strong example is shown by Cole (2014). In Oakland, the median household income is 51.683 dollars, which is relatively close to the national average of 53.046 dollars in the U.S. in 2014 (2.6% lower). However, the regional purchasing power parity is 123.5, i.e., the region is 23.5% more expensive than the national average, which implies that the purchasing power represented by the 51.683 dollar income is only 41.849 dollars in comparative values (being 21.1% lower). Thus, although income differences will be measured, without adjusting for purchasing power between those regions it can lead to false conclusions.

### *Undocumented wealth and income*

Measurements (mostly) involve concepts that can be expressed in numerical values. While this seems simple for economic inequality as wealth and income are expressed in monetary units, in practice this seems much more difficult. For example, bartering is being used by companies to hide price discrimination between transactions (Magenheim & Murrell, 1988). Although the barter and trade industries seem to have a relatively small trading volume, i.e., of 12-14 billion dollars over 2022 (The International Reciprocal Trade Association, sd) which is less than 1% of the GDP[8], it causes an undocumented variance in economic inequality. Another issue regards the valuation of (illiquid) assets which are characterized by infrequent trading, have larger bid-ask differences, and greater price volatility. Examples of these types of assets are real estate, cars, antiques, and arts (Majaski & Potters, 2021). As the actual value of illiquid is difficult and costly to assess in value, they also become more easily to be used for tax evasion (Joint Research Centre, 2019). As such, they form another (unmeasured) variance in economic inequality.

Besides the issues concerning (trade of) assets, also income can be difficult to measure. This can be (partly) caused by undeclared work, i.e., lawful paid activities which are no declared with official authorities (European Commission), or non-monetary compensation (amenities) for labour. For example, labour can be (partly) paid in the form of housing, paid flights, or company-provided gasoline cards. There are indications that monetary and non-monetary compensations are positively correlated to each other with examples shown in Figure 19. This correlation causes that the US and the UK labour market is having more income inequality than monetary earnings would indicate (Clark,

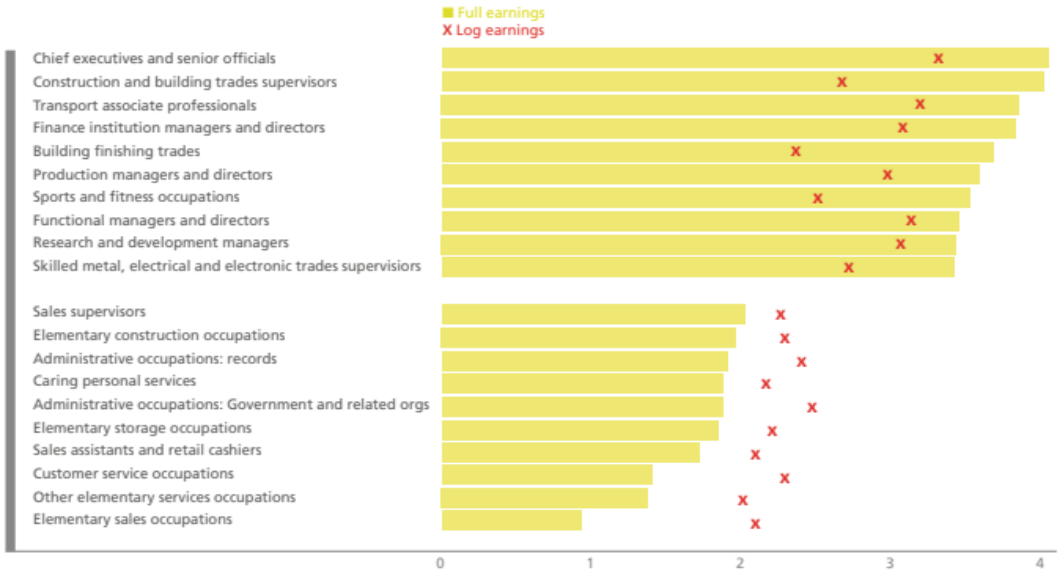


Figure 19 Difference in monetary and non-monetary earnings for various jobs. *Note: Cross indicates monetary earnings and the bars indicate total earnings when adding non-monetary earnings. The upper group indicates jobs that have higher returns due to positive non-monetary earnings, the bottom group indicates jobs that have lower returns due to negative non-monetary earnings. Data has been obtained from the Annual Population Survey. This figure has been obtained from* **(Clark, Cotofan, & Layard, 2021)**.

[8] U.S. GDP was 20.95 trillion in 2020 (The World Bank, sd).

Cotofan, & Layard, 2021). In general, it would be unwise to underestimate the size of undocumented income. For example, the IMF estimated that the OECD countries had 14-16% of their GDP between 1988-2000 to be performed as the shadow economy, also called parallel economy, and is undocumented (Schneider & Enste, 2002). The absence of documentation causes problems for crafting adequate policies as jeopardizes informed decision-making.

### *Life cycle effects*

Moreover, taxation data are acquired once a year and provide a snapshot of income and wealth for that specific year for the whole total population. As such it provides a vertical comparison of the whole population, i.e., within the dataset both a young student and an older experienced worker are included. Therefore, the inequalities measured are partially also "fair" in nature as it resembles a difference in age/experience (Cole, 2014). As an example, a medical student has zero income, while his future expected income will be much higher than the national average income. This effect is mentioned in the Life-cycle theory which was developed by Modigliani (Modigliani, 1966); this theory will further be explained in section Chapter 3. Moreover, Roantree & Shaw (2018) found that the Gini coefficient for inequality was reduced by a fifth if one would analyse household survey data over 18 years instead of an annual analysis.

### Tax data

Taxation is the oldest form of creating financial data in history. It dates back as far back as the start of historic times when pharaohs imposed taxation upon farmers in 3000 B.C. (White, 2002). Throughout history, it has been a financial resource to obtain revenue for the government. However, since the industrial revolution, it is also being used as a data set to estimate the wealth and income of the people. Until the 1960s taxation data was the primary data input to estimate economic inequality in the United Kingdom (Davies & Shorrocks, 1999).

For income tax data it is important to realize that income can be measured during several stages of the taxation process. As such, there are at least three important types of income that can be reviewed (Stone, Trisi, Sherman, & Beltran, 2020):

*Market Income:* all income accrued by labour and capital
*Total income:* market income + social benefits
*Disposable income:* total income - taxation

The various forms of income are important as government intervention is (often) redistributive which reduces economic inequality. For example, the analysis performed by Piketty was based upon market income which omits any of the redistributive policies at hand (Piketty & Saez, 2003). While in contrast, the claim that the Netherlands is one of the most equal states worldwide is based upon disposable income. When reviewing the market income, the Netherlands is much more unequal and is certainly not at the frontier of equality (Berg, Ostry, Tsangarides, & Yakhshilikov, 2018), as shown earlier in Figure 18.

Limiting to tax data is that the data can have predefined inclusion/exclusion parameters which can affect the outcomes for economic inequality. For example, pension funds are often exempted from taxation (Cole, 2014). This has been justified as pensions

represent social security, but also pension funds cannot be controlled by the entity, i.e., it is not possible to extract wealth out of pension fund and as such to react upon taxation. However, it does represent a (large) sum of wealth that has a predefined allocation to the individuals receiving it. As the pension can differ between individuals, this can lead to large differences in what is measured and what is occurring in practice.

Another issue with tax data is the occurrence of missing data due to untaxed assets. For this, a distinction can be made between intentional (malicious) and unintentional untaxed assets. Broadly speaking, the issue can be split between individuals who are unwilling to provide complete reports regarding their income and wealth to increase their income and wealth, and the governments that are unable to obtain complete tax reports due to their (failing) system. For example, in India only slightly over 6% of the population pays taxes which means that via tax collection data the other 94% of the population remains unmeasured (Alvaredo, Chancel, Piketty, Saez, & Zucman, 2018). From a data perspective, not measuring such a large group of the population can lead to (large) mistakes when attempting to estimate economic inequality.

Problematic to the intentional tax avoidance and evasion, is that it occurs mostly among the wealthy population because they have the highest incentive to avoid taxation as they are impacted the most by it. As such, there is certainty that this effect leads to an underestimation of economic inequality (Alstadsaeter, Johannesen, & Zucman, 2018). Difficult to this issue is that there are various opportunities to engage in tax avoidance and evasion. For example, the OECD (2018) lists six of the most important routes used: 1. Tax shelters through concealing vehicles, 2. tax cap provisions, 3. exemption through business assets, 4. discrepancies in tax rate between tax bases, 5. Global reallocation of wealth, and 6. Failing to declare tax. From the data perspective, it is estimated that tax avoidance and evasions lead to 8% of the global wealth being stored within tax havens and 6% of the global wealth being hidden from tax accounts (Zucman, 2014), as seen in Figure 20. Moreover, the efforts to engage in tax avoidance and evasion seem to be concentrated among a smaller number of people causing a large data gap with respect to economic inequality. For example, fewer people are using offshore accounting, but the amount of wealth is increasing (Saez & Zucman, 2016).

| | *Offshore wealth ($ billions)* | *Share of financial wealth held offshore* | *Tax revenue loss ($ billions)* |
|---|---|---|---|
| Europe | 2,600 | 10% | 75 |
| United States | 1,200 | 4% | 36 |
| Asia | 1,300 | 4% | 35 |
| Latin America | 700 | 22% | 21 |
| Africa | 500 | 30% | 15 |
| Canada | 300 | 9% | 6 |
| Russia | 200 | 50% | 1 |
| Gulf countries | 800 | 57% | 0 |
| **Total** | **7,600** | **8.0%** | **190** |

Figure 20 Offshore financial wealth. *Note: Wealth includes only financial assets (equity, bonds, mutual fund share, and bank deposits). Lost tax revenue is based upon the evasion of personal income and wealth taxes. Results are obtained by the article's author's calculations. This figure has been obtained from Zucman* (Zucman, 2014).

While there is the certainty that data are missing, there is unknowingness of the size of the missing data. Current estimations are that up to 32 trillion dollars of offshore wealth are potentially being missed from calculations (Shaxson, Christensen, & Mathiason, 2012). Not only do tax evasion and avoidance deprive tax revenue, but it is also described as violating human rights and causing extreme poverty (International Bar Association's Human Rights Institute, 2013). While these damaging effects are occurring, the authorities are vigilant to attempt to avoid tax evasion. One important implementation has been the Automatic Exchange of Information (AEOI) on taxation. In 2018 approximately 4.9 trillion-euro worth of financial accounts were being tracked by this system, hampering tax evasion possibilities of these accounts (OECD, 2019). As such, these attempts have contributed to "finding" 1/7$^{th}$ of the missing wealth.

However, it should be remarked that while taxation covers (almost) the whole population and creates large amounts of detailed data, its primary goal is to obtain income for the government. The collected data are a side effect of taxation, which was never intended to create a database to estimate income and wealth distributions (Cole, 2014).

## Household surveys

Whereas tax data generates income and wealth distributions through sampling large portions of the population, household surveys attempt to generate income and wealth distribution via sampling. The general idea is that household surveys can generate more complete data sets as t can also include undocumented (untaxed) assets and income, but also give more data concerning household size, job occupancy, and other secondary parameters (United Nations Statistics Division, 2005). However, collecting survey data is time demanding and is, therefore, an expensive form of data collection. Therefore, only small subsamples of the population are used to decrease the costs of data sampling (OECD, 2013). Moreover, household surveys have their issue with the following two types of errors complicating measurements (Banda, 2005):

### *1. Sampling errors*

A sampling error is a mistake of viewing the result of the questions asked in the sample to be equal to the results which would have been obtained when sampling the whole population. This type of error is influenced by the size of the population sampled and the effect of random sampling.

### *2. Non-sampling errors*

The other type of error, non-sampling, is the combination of all kinds of errors which leads to the fact that the result obtained does not equal the result for the whole population investigated. For the field of household surveys, the following five are the most important (Biemer & Lyberg, 2003):

#### *I. Specification error*

This error is caused by an ambiguous line of questioning. A question such as "Did you complete school?" is open for interpretation as it could mean middle school, high school, college, or university. Depending on one's interpretation of what is meant the question will be answered differently and no accurate data is obtained from the question.

### *II. Frame error*

When creating a survey, the targeted population can differ from the population which needs to be sampled, which can be both too large or too small – with the latter being a non-coverage error.

### *III. Non-response error*

The surveys within the targeted population can either be partially or completely non-answered. The combination of non-response and a frame error, i.e., non-coverage error, is called a non-observation error.

### *IV. Measurement error*

This type of error can be subdivided into four aspects:

*a. Questionnaire:* This is the overarching visual aspect of the survey and the choice of words that can affect answering.
*b. Data-collection method:* How the survey is being taken, it can be done via paper, electronically, in person, or own diary
*c. Interviewer:* The interviewer can create biases in answering questions by the manner of questioning and his presence while answering private questions
*d. Respondent:* Answers are dependent on social background and educational differences

### *V. Processing error*

The acquired data needs to be processed to obtain a result that can be interpreted. Errors can for example occur with faulty data handling, computational errors, and data editing.

A limitation of the surveys is the inability to capture the extreme ends of the wealth and income spectrum. As explained by the OECD (2013) the very poor have no interest in answering wealth surveys as they have next to nothing to declare. On the other side of the spectrum, the very wealthy avoid giving details about their financial status, or give inaccurate information, as it could be counter beneficial to evade taxation and/or gain unwelcome attention. It has been shown by Vermeulen (2014) that non-response error is positively correlated with wealth, and this causes a downward effect on the wealth distribution. Another example is that a high percentage of those who said they held business assets failed to provide an estimate of the value of such assets (Daffin, 2009). Essentially, the core weakness of surveys is that there is no legal obligation to answer the questionnaire (correctly) mainly affecting the end of the distribution.

Besides the issue of inaccurate answers, the very wealthy are a small niche of people who have small odds of being sampled when using random sampling. This, in combination with the non-response error, can create an underrepresentation of this group. To counter underrepresentation, it is possible to use oversampling. To do this correctly a second database can be used to estimate the size of the oversampling required (Kennickell, 2008), for the super-rich this his can be done by using taxation data (Eckerstorfer, et al., 2015). However, the European Central Bank (ECB) and Household Finance and Consumption Survey (HFCS) have attempted to use such an oversampling strategy for household surveys across various EU nations but seemed to be ineffective to compensate for the non-responder error (Vermeulen, 2014). It was noted by a member of the Federal Reserve that

the Survey of Consumer Finances (SCF) was not designed to capture the top 0.5% of the wealth distribution and purposely excludes members of the Forbes 400 list (Wolff E. W., 2017). Overall, the design of the surveys causes the inability to capture the wealthiest amongst the population. According to the recent research of Yonzan et al. (2021), this inability only holds for the top 1%, the remaining 99% can adequately be captured by household surveys.

### List of large wealth owners

The 'super-rich' is a specific and important niche when evaluating wealth and income inequality. This is caused by the fact that this small group of people owns large amounts of wealth. For example, it is estimated that the richest 1% of the US population owns 1/3rd of the total wealth (Kennickell, 2008). In previous paragraphs concerning taxation data and surveys, data problems were highlighted concerning the hiatus in data of the super-rich. The super-rich tends to avoid supplying information concerning their wealth either due to financial and fiscal reasons or because they attempt to avoid attention to their persona. However, for analysis of wealth distributions, the omission of the super-rich and their large wealth hamper proper analysis. It is therefore of interest to gain more detailed knowledge about their financial status to be able to effectively create policies that affect them.

Luckily there are a few organizations, such as Forbes and Quote, which analyse the super-rich intensively. While these lists originally were created for entertainment reasons, their existence gives vital information for current wealth and income distribution analyses. The rich lists can fill up data gaps partly which are present when using surveys. However, a large gap in wealth remains when rich list data and survey data are combined. For example, Belgium has a tremendously large data gap of 1,912 billion euros when the data sets are combined (Vermeulen, 2014), as shown in Figure 21.

However, the data gap can be closed due to an interesting phenomenon discovered by Pareto (1897). He showed that the richest wealth owners seem to follow a mathematical distribution which later has been called the Pareto distribution. He found that the wealth of a specific member can be expressed by the following function of the wealth of the richest person (A), the rank number (r), and the Pareto variable (α)

| | Maximum wealth SCF/HFCS | Minimum wealth Forbes |
|---|---|---|
| US | 806 | 737 |
| Germany | 76 | 818 |
| France | 153 | 810 |
| Italy | 26 | 893 |
| Spain | 409 | 780 |
| Netherlands | 5 | 958 |
| Belgium | 8 | 1920 |
| Portugal | 27 | 1110 |
| Austria | 22 | 1560 |
| Finland | 15 | 958 |

Figure 21 The gap between SCF/HFCS's maximum and Forbes' minimum recorded wealth. *Note: The results are based upon the article's author's calculations. This figure has been obtained from* **(Vermeulen, 2014)**.

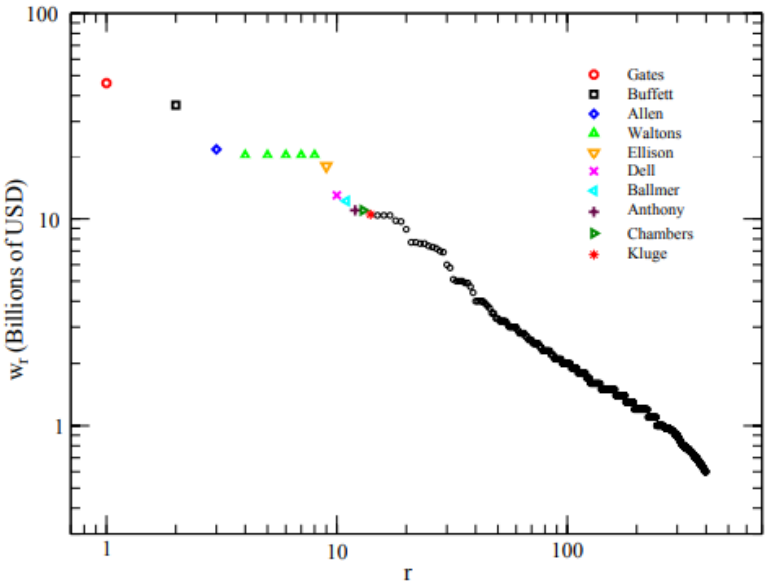


Figure 23 Zipf plot. *Note: Data has been obtained from Forbes 400 in 2003. Wealth and rank are plotted on a log-log scale. A Pareto exponent of 1.22 has been found for ranks between 10 and 400. This figure has been obtained from* **(Klass, Biham, Levy, Malcai, & Solomon, 2006)**.

$$w_r = A * r^{-\frac{1}{\alpha}}$$

The usefulness lies in the extrapolation, for example, in the recent work of Blanchet et al. (2021) they state that they can estimate the wealth of the top 5% with 3% accuracy using (only) 100.000 data entry points. This can be made intuitive by plotting rank and wealth data on a Zipf plot (log-log plot), as shown in Figure 23. Interestingly, the Pareto variable does not seem to be constant in time. Klass et al. (2006) analysed the data from the Forbes list 400 between 1988 and 2003 and found that the Pareto variable decreased over time which indicates an increasing inequality, as shown in Figure 22. What is puzzling about this distribution is that skill and ability mostly follow a Gaussian

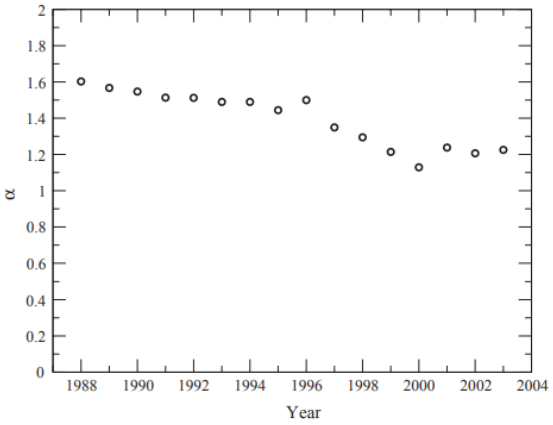


Figure 22 Pareto value across time. *Note: Pareto values (y-axis) are obtained by applying a Zipf analysis on data from the Forbes 400 list between 1988-2003 (x-axis). This figure has been obtained from* **(Klass, Biham, Levy, Malcai, & Solomon, 2006)**.

distribution, such as IQ with the norm at 100. Therefore, if skill and ability would directly correlate with wealth it could not follow a Pareto distribution. Overall, this leads to the explanation that wealth for the richest persons is rather based upon chance instead of skill (Levy, 2003).

However, the outcomes of the analyses of Forbes are not perfect and mistakes are made when estimating wealth. For example, in research comparing tax data to the Forbes list, it was found that there were 26 individuals who upon death appeared to have enough wealth to enter the Forbes 400 list but they were never listed (Raub, Johnson, & Newcomb, 2010). It appears that mistakes are made when estimating the dispersion of wealth among family members or when estimating the wealth coming from creative endeavours. As mentioned earlier, it can particularly be difficult to estimate the value of illiquid assets such as paintings, and price discovery only occurs when the commodity is traded (or upon death when assigned value through inheritance taxation). Thus, estimating the Pareto variables based on the Forbes list can lead to an underestimation of the wealth owned by the wealthy and the extrapolation will be an estimation, but not a perfect fit. Attempts have been made to improve the Pareto model with, for example, a recent publication by Blanchet et al. (2021). However, for this thesis further evaluation of such updates is regarded to be beyond the scope of analysis.

## 2.2 Quantification

This section will discuss how data can be translated into the quantification of economic inequality. A common method is translating measurements and graphs into a single distribution value, i.e., a numerical figure which represents the measure of inequality for the reviewed system. The elegance behind these indices is that a complex system becomes summarized into a single comprehendible value which enables cross-country comparison and can measure the impact of policies (Department of Economic and Social Affairs, 2015). However, the large drawback to these indicators is that they are precisely just that, they are a single value. Trying to capture a whole economy and the inequalities present within that country drastically simplifies the dynamics of that country and possibly does injustice to the whole complexity (McGregor, Smith, & Wills, 2019). Nonetheless, inequality parameters are widely used and therefore require attention as they will pass by more frequently than not in economic inequality analyses.

While there is a wide variety of indices, there are four main conditions to which all indices must comply (Costa & Perez-Duarte, 2019):

1. *Anonymity:* The owner of the measurement should not have an impact on the outcome of the metric.
2. *Scale independency:* The inequality should not be affected by the magnitude of income or wealth; for example, if an economy has twice the income (on average per person), or uses a different currency, the metric itself should not be influenced.
3. *Population independence:* The inequality should not be dependent on the size of the population measured.
4. *Pigou-Dalton transfer principle:* The transfer of measurement from a rich person to a poor person should at least not increase the metric, but preferably decrease the metric.

Beyond these four main principles, Costa & Perez-Duarte (2019) state that it is beneficial for an indicator to be decomposable. This means that a population can be decomposed into various sub-groups, but the addition of all these sub-groups leads to the same value as when the whole group is analysed as one group.

To set boundaries to the scope of analysis, as Coulter could find over 50 indices that measure inequality (Coulter, 1989), only indices that evaluate monetary differences (concerning economic inequality) will be reviewed. In this category, four different families of indices can be recognized that require attention:

1. Family of Lorenz indices
2. Family of generalized entropy indices
3. Family of ratio indices
4. Family of poverty indices.

While the various families will be discussed in each section, it should be noted that there are some general aspects one should be aware of. These general remarks relate to the following aspects: 1. relative and absolute differences, and 2. database inconsistencies.

### *Relative and absolute differences*

An important distinction to be made is between relative and absolute differences. This is most clearly explained by providing an example: person A owns 10.000 euros and person B owns 20.000 euros, in this scenario person B owns 2 times as much as person A. When person A gains 10.000 euros (total of 20.000 euros) and person B gains 15.000 euros (total of 35.000 euros) then person B owns 1.75 times as much as person A. In this scenario, there is a decrease in relative inequality (person B owns a factor of 1.75 more instead of 2) but an increase in the absolute difference (person B has gained 5.000 euros more than person A). This difference is of importance as its evolution can differ. For example, Atkinson & Brandolini (2010) demonstrate that relative inequality seems stable in the last 50 years, but absolute difference increased dramatically, as shown in Figure 24.

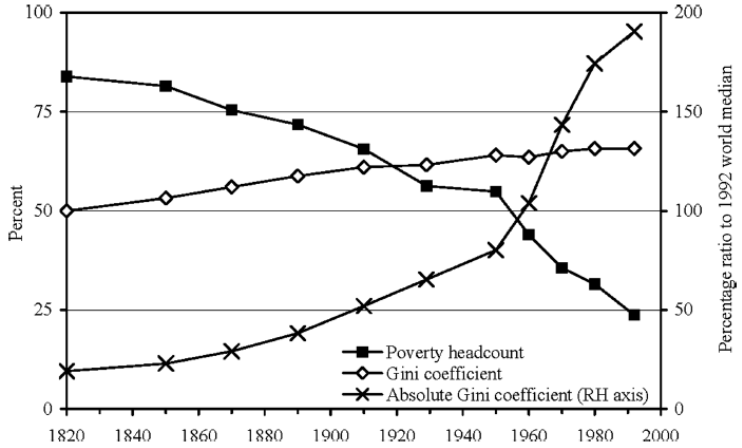


Figure 24 Different perspectives for different indices. *Note: Progression of poverty headcount, Gini index, and absolute Gini index between 1820-1992. This figure has been obtained from* **(Atkinson & Brandolini, 2010)**.

### *Database inconsistencies*

It has been already mentioned that there are various forms of obtaining data, but it has not been discussed that there is already an abundance of institutions that attempted to create large databases of information regarding economic inequality. This is important because there is a large debate and uncertainty about which database is superior to the other. As neatly described by Galbraith (2019), it is not easy to investigate the various databases. The widely supported Luxembourg Income Study Database (LIS) is regarded as one of the top-tier databases due to its thorough investigation of data. However, due to their thorough investigation, the database is mostly limited to developed countries as developing countries cannot provide detailed economic information. In essence, when reviewing a large database, one needs to be aware of which kind of data they use and how they process that data.

### Family of Lorenz indices

The family of Lorenz indices use the Lorenz Curve as the basis for their calculations which was developed by Lorenz (1905). The basic principle of the Lorenz curve is that it is a per cent-per cent (P-P) plot that evaluates two cumulative distribution functions, as shown in Figure 25. Having perfect equality would mean that for every additional person the same share in the total is added, which results in the 'line of equality'. In the scenario of perfect inequality, everything is owned by one individual; this would be depicted as a straight horizontal line and at the far right end of the curve with one entry who owns everything.

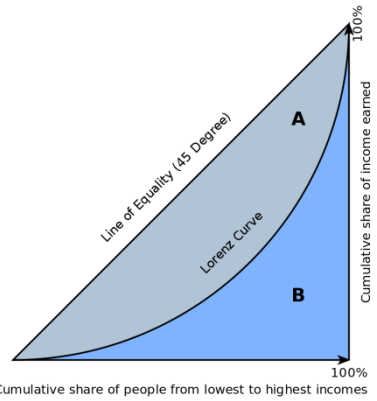


Figure 25 – Example of a Lorenz Curve *Note: This figure has been obtained from* (Wikipedia, sd).

While in essence there are no restrictions to what is being plotted, the functions are normally income or wealth on the y-axis and individuals on the x-axis. Problematic with the Lorenz curve is that it is not easily compared with other Lorenz curveseventhough it has a simple graphical representation. In Figure 26, various Lorenz Curves of various countries have been plotted showing distinct differences, but the immediate interpretation of the curves could be difficult. This especially occurs in situations when curves are crossing. Various indices tried to solve this issue and translated the Lorenz curve into a numerical value. For this thesis, only the most famous one, i.e., the Gini index (Eliazar & Sokolov, 2012), will be reviewed to keep the thesis concise.

### *Gini index*

The Gini index has been formulated by Corrado Gini in 1912 (Ceriani & Verme, 2011). He developed the numerical translation of the Lorenz curve by dividing the surface size beneath the Lorenz curve by the surface beneath the perfect equality line – i.e. A/(A+B) which equals A/0.5 or 2*A, as shown in Figure 25. The index has a value between 0 – perfect equality – and 1 – perfect inequality. Perfect equality is acquired when everyone has exactly the same value while perfect inequality is acquired when everything is owned by one person. The Gini index conforms to all four main conditions but does fail

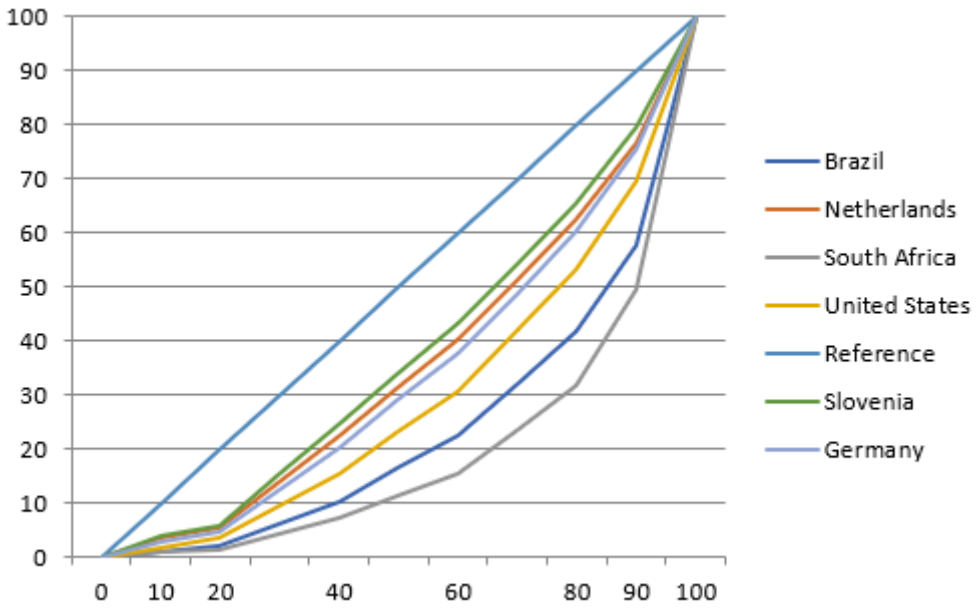


Figure 26 Example of Gini curves for selected countries. *Note: The results are obtained using data acquired from the World Bank database in 2022* (World Bank, sd).

to comply with decomposability. Thus, when a group is divided into two groups, the average Gini index of those two groups will not be the same as the Gini index of the group as a whole.

There are some notable complexities to the Gini index with a large drawback being that the Gini Curve is more sensitive to transfers to the middle than compared to the tails. This has the consequence that policies aimed at the Gini Curve will have more benefit from helping the middle class than the lower class (Atkinson, 1970). The general issue with the Gini index is that the middle class globally seems to have a stable portion of the economy (this will be discussed in more depth when discussing the Palam ratio and is shown in Figure 33). The stability of the portion of income for the middle class has the important consequence that the Gini Curve value is limited to roughly a maximum of 0.6 (Palma, 2011). The combination of the statements of Atkinson, i.e., sensitivity to the middle portion, and Palma, i.e., stability of income of the middle class, means that differences in the Gini curve tend to be somewhat limited.

To obtain a grasp of the range of the Gini index, I calculated the global characteristic using data from the World Bank (World Bank, sd), these results are shown in Figure 27. The average Gini index value is 0.377 (+/- SD: 0.079), with the lowest value being 0.242 (Slovenia) and the highest value being 0.630 (South Africa). As visualized, the bandwidth of the values is rather limited when reviewing all countries in the world. As such, one hypothesizes that the limits of the Gini index are in practice closer to 0.2 and 0.7 than the theoretical 0 and 1.

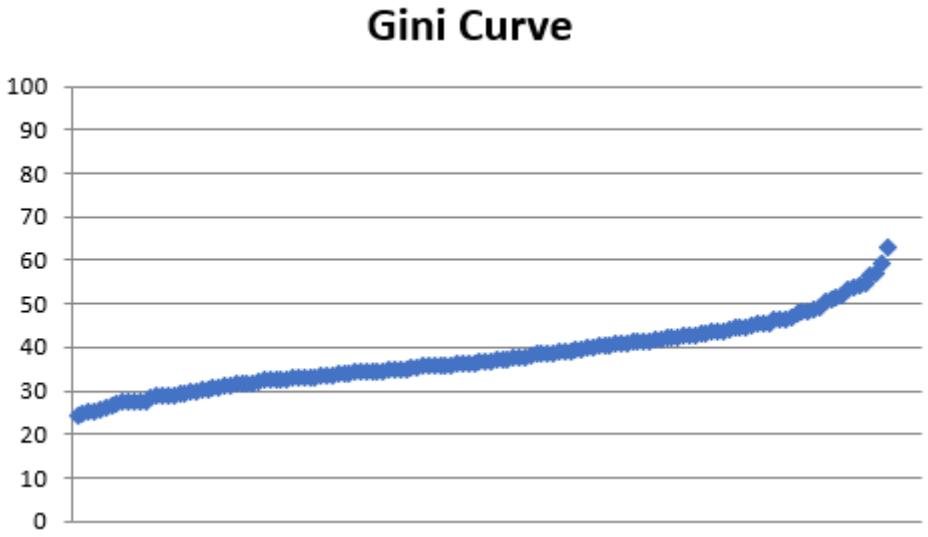


Figure 27 Gini Index value from all countries *Note: Gini Index is ordered ascendingly along the x-axis. The results are obtained using data acquired from the World Bank database in 2022* (World Bank, sd).

### Family of generalized entropy indices

Generalized entropy (GE) indices are a special family of inequality indices that analyse the 'randomness' of a distribution (Eliazar & Sokolov, 2012). The power of GE indices is that they both conform to the four main conditions of the inequality indices and the decomposability principle (Costa & Perez-Duarte, 2019). Thus, the value obtained from a GE index can be decomposed into smaller groups from which the various GE indices will combine into an overarching GE index value for the whole group. These specific attributes are unique for the generalized entropy indices and are the only family of inequality indicators that comply with all principles (Cowell, 2011). The mathematical principle of the GE indices is based on the principles of Shannon's information entropy. The general mathematical formula for the GE indices is as follows

$$GE(\alpha) = \begin{cases} \frac{1}{N\alpha(\alpha-1)}\sum_{i=1}^{N}\left[\left(\frac{y_i}{y}\right)^{\alpha}-1\right] & \alpha \neq 0,1 \\ \frac{1}{N}\sum_{i=1}^{N}\frac{y_i}{y}\ln\left(\frac{y_i}{y}\right) & \alpha = 1 \\ -\frac{1}{N}\sum_{i=1}^{N}\ln\left(\frac{y_i}{y}\right) & \alpha = 0 \end{cases}$$

N is the number of identities, $y_i$ is the income for identity *i*, $y$ is the mean income of all *i*'s, and α attributes as a weight factor to indicate the importance of large incomes. When α is high one puts a large weight on high income whereas a low α puts a large weight on low incomes. There are three unique α values for the GE index:

- α = 0: The mean log deviation measure, sometimes also referred to as Theil's L index
- α = 1: The Theil's T index
- α = 2: The squared coefficient of variation

In general, the GE index adheres to the following properties:

1. The minimum value equals 0, this shows perfect equality
2. The maximum value equals ln(N), thus being open bounded
3. Decomposition of an analysed system can cause that separate sub-systems have a negative value, however, the sum of all sub-systems is always positive
4. Moving towards 0 always goes slower than moving from it.

### *Decomposability*

The unique capability of decomposition means that inequality can be measured between and within sub-systems (Cowell, 2011). This creates a larger array of opportunities when attempting to determine the source of inequality in a system. As an example, Figure 28 shows an analysis of the geographical dispersion of contribution to the inequality within the USA. It shows that the highest contributions derive from the coastal areas of the USA and some other urbanized areas. This knowledge can be used to perform a more in-depth analysis enabling potential policies which are focused on those specific sub-populations. However, it should be noted that the decomposition analysis shows the relative contribution to the overall inequality. While the relative contribution of a sub-population to inequality may be limited, it does not exclude the possibility of the occurrence of inequality within the specific sub-system. It requires between and within-group analysis to be aware of this potential interference. Moreover, the analysed areas should be comparable in size to create unbiased results (Novotný, 2007).

On the matter of between and within-group analysis, an interesting analysis has been performed by Novotny (2007). To be able to perform a between and within-group analysis of a system the generalized entropy formula (keeping α=1) needs to be expanded:

$$T = B + W = \left(\sum_{j=1}^{k} \frac{n_j}{n}\frac{y_j}{y}\ln\left(\frac{y_j}{y}\right)\right) + \left(\sum_{j=1}^{k} \frac{1}{n}\frac{y_j}{y}\sum_{i=1}^{n_j}\frac{y_{ij}}{y_j}\ln\left(\frac{y_{ij}}{y_j}\right)\right)$$

In this formula, the unit of analysis is composed of $k$ regions, where $n_j$ corresponds to the population size of the $j$th region, $y_j$ the mean income of the $j$th region, and $y_{ij}$ to the income of an individual in the $j$th region. In such a formulation $B$ corresponds to the inequality attributed between the regions and $W$ corresponds to the inequality within the

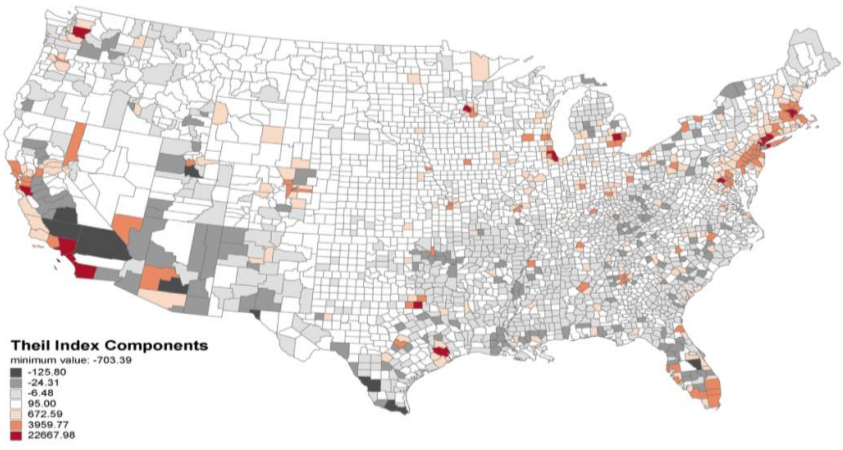


Figure 28 Decomposition of Theil's T for the US in 2004. *Note: This figure has been obtained from* **(Wikipedia, sd)**.

region. Novotný (2007) calculated the Theil index for the group of several nations with the results shown in Figure 29; The exact value is of less importance, the main interest is in the fact that one can distinguish where inequality is occurring, within or between systems. Novotny mentions that on a global scale "inequality-between subsystems" has a larger contribution to global inequality, while on a national level the inequalities are more frequently within subsystems (Novotný, 2007).

| | Estimates of within-region inequality ($W' = T' - B$) | | |
|---|---|---|---|
| | Low $W' < 0.150$ | Medium $W'$ (0.150, 0.300) | High $W' > 0.300$ |
| Low regional inequality $B < 0.015$ | *Sweden, Netherlands, Norway, Austria, Denmark* | USA, Australia, Japan, Canada, UK, Switzerland, France | **Senegal** |
| Medium regional inequality $B$ (0.015, 0.059) | *Finland, Germany,* Spain, Poland, Czech Republic, *Belgium* | Ireland, Italy, China | **Paraguay, Madagascar, Bolivia,** Uzbekistan, Russia, **Nepal, Egypt, Mexico,** Argentina |
| High regional inequality $B > 0.060$ | *Hungary,* India, Estonia, Kyrgyzstan | Vietnam, Indonesia, **Thailand, South Africa** | Peru, **Chile,** Niger, **Sri Lanka,** Philippines, **Brazil,** Kazakhstan |

Figure 29 Analysis of intra- and interregional inequality for various countries. *Note: The grouped countries within a specific structure of inequality are sorted ascendingly according to their B value. Countries in bold have T' > 0.500 (high inequality) and countries in italics have a T' < 0.150 (low inequality). This figure has been obtained from* (Novotný, 2007).

### *Atkinson's Index*

Atkinson's index is developed by Anthony Atkinson (1970) as an answer to fallacies he found in other inequality measures. While the Atkinson index is not directly related to the family of the GE indices, it can be proven that its transformation is directly related to the family of GE indices. As such, it is discussed as a branch of the family of GE indices as it also has the same advantages, i.e., adhering to all conditions. The (none-transformed) Atkinson index is calculated using:

$$A = \begin{cases} 1 - \frac{1}{y}\left(\frac{1}{N}\sum_{i=1}^{n} y_i^{1-\varepsilon}\right)^{\frac{1}{1-\varepsilon}} & 0 \leq \varepsilon \neq 1 \\ 1 - \frac{1}{y}\left(\prod_{i=1}^{N} y_i\right)^{\frac{1}{N}} & \varepsilon = 1 \end{cases}$$

The core aspect of the Atkinson index is that it measures the difference between the income of the low-earning population to the mean of the population, for which it is normalized to run from 0 to 1. The fallacy he wanted to solve is the input of aversion to inequality, he did this by adding ε which can run from zero to infinity. At ε = 0, there is no aversion to inequality and the Atkinson index will always be 0. At ε = ∞, there is an absolute aversion to inequality by which the lowest income, i.e., closest value to 0, will dominate and thereby the Atkinson index will limit to 1. An important feature of the Atkinson index is that it can adjust the weight of importance to the difference between low-income and the mean-income, but it is not capable of evaluating the mean to the highest incomes.

Another interpretation of the aversion to inequality parameter is that it resembles the price one is willing to pay to achieve equality. This aspect can be explained using Figure 30 where the y- and x-axis represent the income of two individuals. The dotted line represents equal income between the two. Starting at A, a situation where $y_2$ has more income than $y_1$, equality between $y_1$ and $y_2$ can be achieved by moving towards the dotted line. In the case where there is no aversion to inequality, i.e., $\varepsilon=0$, this can be done by drawing a line perpendicular from A to the line of equality, hitting point B. As such, equality has been achieved by a simple transfer of income without causing change to the total income, i.e., the sum of $y_1$ and $y_2$ is the same at point A as at point B. If there is a form of inequality aversion, i.e., $\varepsilon > 0$, then the perpendicular line will transform into a concave line and equality will be at, e.g., point C. However, at point C the sum of $y_1$ and $y_2$ is lower than at point A thereby obtaining a lower total income within the system. Thus, showing the willingness to sacrifice a certain amount of total income to obtain equality. This sacrifice becomes the largest when $\varepsilon$ limits to infinity. In that case, the redistribution of income is achieved by subtracting income from $y_2$ such that it becomes equal to $y_1$, i.e., equality is obtained by removing all surplus income that is higher than the lowest income in the system without redistributing it (Bellu & Liberati, 2006).

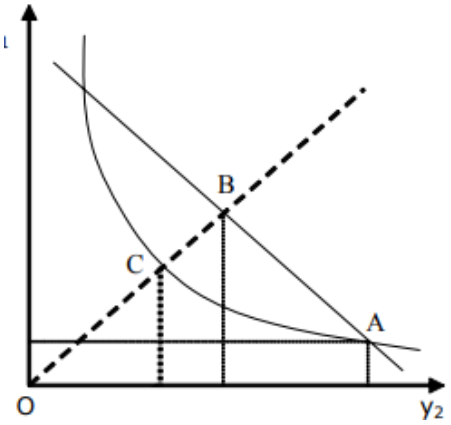

Figure 30 Figurative illustration of the Atkinson index. *Note: An income partitioning of A can be equalized by moving to a point on the dashed line. Depending on the aversion to inequality this can be somewhere between B and the intercept of the dashed line and the horizontal line of A. This figure is an adaptation of the figure obtained from* (Bellu & Liberati, 2006).

Viewed from the willingness to pay to obtain equality it becomes clear that the limiting cases, i.e., zero and infinity, will never be socially applicable. Zero will not be possible because there are costs linked to redistribution, thus equality without costs is not possible. Infinity is also undesired as this would mean the removal of income without any benefits to other entities in the system, only having losers in a system will never obtain political traction. This leaves an arbitrary judgement as to which value of $\varepsilon$ is preferred, i.e., what is society willing to pay for equality? In the article of Atkinson & Brandolini (2010), there are various values used, but the values range from 0.125-2, thus staying far from infinity. It is not possible to mention that there is one "good" value for the parameter. It is highly dependent on various factors which differ per country. Lambert et al. (2003) show that the aversion to inequality parameter for society is dependent on politico-socioeconomic factors such as economic inequality, female equal rights, capita growth, and GDP per capita which was also noted earlier in section 1.3 Education.

### Family of ratio indices

A different family of indices commonly used is that of the ratio indices which neglect portions of the distribution (most often the middle portion). They put their aim at specific portions which are of interest due to policy intervention as the variance in the distribution mostly occurs within those regions. The advantage of the ratio indices is their simplistic characteristic which makes interpretation rather straightforward. For

example, a top-bottom decile ratio of 10 simply means that the top 10% earn 10 times as much as the bottom 10%. This is easier when compared to a Gini Index value of 0.336 or an Atkinson Index value of 0.60, these values mostly obtain meaning only once compared relatively to another value. There are various ratios which can be used, but the more frequently used are the equipartition top-bottom ratios and the Palma ratio, which will be discussed in the following sections.

### *Equipartition top-bottom ratios*

The equipartition ratios are ratios which use a similar top and bottom size when making the comparison with the top-bottom decile and top-bottom quintile ratio being the most common. While they both are more frequently used, one could state that the decile ratio gives more valuable information. The reason for this is that one finds that on a global scale the 10th decile (top decile) has a larger variance in its relative income share than the 9th decile of the distribution (Palma, 2011), as shown in Figure 31. Also on a temporal scale, there are indications that growth in wealth and income is mainly occurring in the upper percentiles of society (Oxfam international, 2018). As the 9th decile is relatively stable, it causes that the quintile ratio becomes less sensitive to changes as the differences are averaged out. While one could state that taking even smaller equipartition sizes could enhance the sensitivity of changes, e.g., top-bottom 1%, there are limitations to decreasing the equipartition sizes. First, the bottom portions of the income distribution have negative income which could lead to negative ratio values (which losses all meaning). Secondly, with decreasing portion, one would obtain even more volatile values, but the gained value becomes debatable. With the smaller size of the unit of analysis, the less suitable it is to use it as value for the population as a whole. For example, comparing the richest person in a country with the poorest person in a country will give a drastic ratio, but one can hardly say that inequality within the country can be based upon that value. There is no

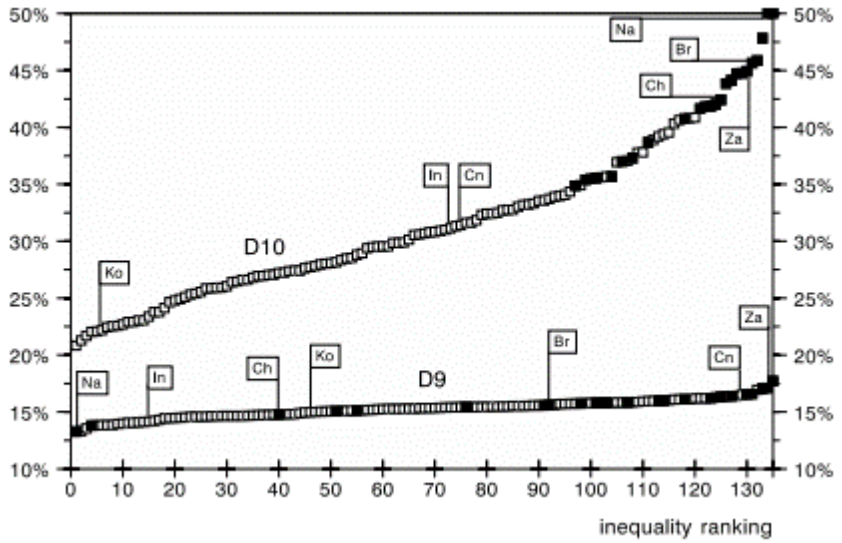


Figure 31 Relative income share of the 9th and 10th decile for various countries. *Note: Ranking from the 9th and 10th decile are independent of each other. Botswana's and Namibia's 10th decile data points are beyond the graph's borders, values are 51% and 65% respectively. Data has been obtained from the World Bank in 2010. This figure has been obtained from* (Palma, 2011).

Table 2 Characteristics of quintile and decile ratios. *Note: The results are obtained using data from the World Bank only including data points after 2010* (The World Bank, sd).

| Country | 20:20 | 10:10 |
|---|---|---|
| *Lowest score* | *3.4 (Slovenia)* | *5.0 (Slovenia)* |
| Netherlands | 4.3 | 6.7 |
| Germany | 5.2 | 8.5 |
| United States of America | 9.2 | 17.9 |
| Brazil | 18.8 | 42.5 |
| *Highest score* | *28.4 (South-Africa)* | *56.1 (South-Africa)* |
| Mean | 7.8 (+/- 4.1) | 14.0 (+/- 9.3) |
| Median | 6.6 (IQR: 5.2-8.7) | 10.9 (IQR: 8.2-15.7) |

definitive rule on what the most relevant frame of reference is but one must be aware that reducing the size of the frame of reference comes at the cost of generalizability.

To gain an idea of what the size of the ratio indices are around the globe, I calculated general characteristics using data from the World Bank with the results being shown in Figure 32 and Table 2. Advanced economies appear to have the lowest ratio values, with the USA having the highest value amongst that group, and third world countries having higher values, especially in Africa – 7 of the 10 highest values are African countries. Moreover, the average quintile and decile ratio are respectively 8 and 14 with a higher variance for the decile ratio than the quintile ratio. This is expected as moving further to the tails of the distribution the impact of outliers becomes larger.

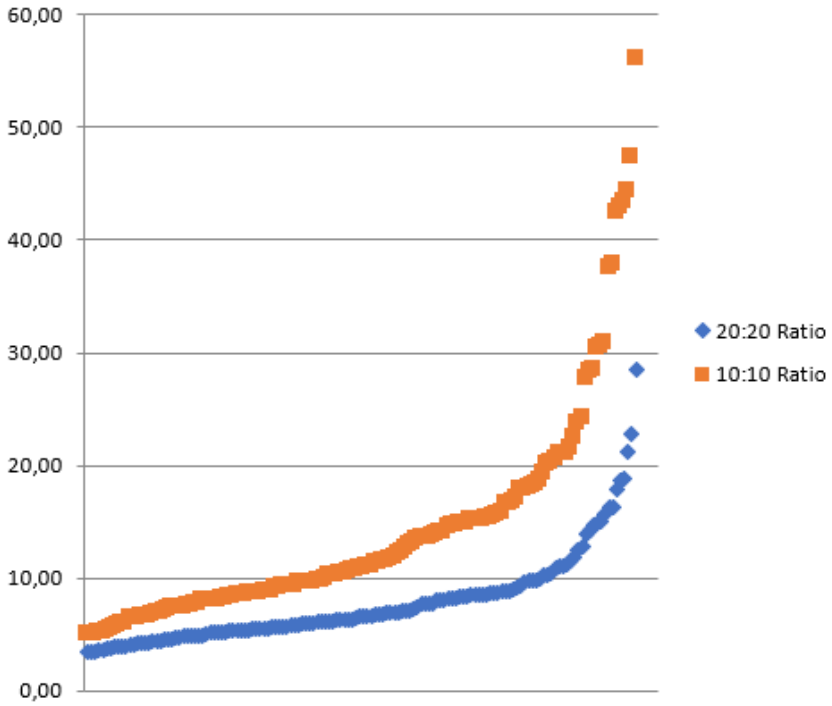


Figure 32 The 10:10 and 20:20 ratios aligned ascendingly. *Note: The results are obtained using data from the World Bank only including data points after 2010* (The World Bank, sd).

### *Palma ratio*

A different type of ratio-based indices is the Palma ratio with the term being coined in 2013 to refer to Palma's work (Cobham & Sumner, 2013). The unique feature of the

Palma ratio is that it is not equipartitioned but uses the top 10% in comparison to the bottom 40%. Palma did so because he noticed that the 5th to 9th decile for most countries has a stable portion of income share – roughly 50% -, and as such the largest variance occurs in the lowest 40% and highest 10% of the income distribution, as can be seen in Figure 33. Therefore, he reasoned that using the ratio of the 10th decile compared to the 1st to 4th decile gives all "necessary" information about the income distribution of the country (Palma, 2011). The importance of the 10th decile is accentuated by various studies which find that accumulation of wealth occurs mostly within the highest income/wealth deciles of the economy (Atkinson, 2005; Piketty & Saez, 2003). The usage of only the 10th decile can be supported by the fact that the variance of income for the 9th decile is far more stable compared to national income as compared to the income of the 10th decile across the globe (Palma, 2011), as shown previously in Figure 31. Thus, the overall conclusion is that the income inequalities are mostly a matter of the top 10% accruing larger shares of national income at the cost of the bottom 40%, hence the Palma ratio.

While the Palma ratio only uses 50% of the income distribution mathematically, it has been shown by Tridico (2018) that it is almost linearly correlated to the Gini index, as shown in Figure 34. This has also been noted by Cobham & Sumner (2013) who found that the Palma ratio can be directly correlated to the Gini index. In their analysis they show that the Gini Index can be predicted with 99% accuracy when using the following formula:

*Gini index = 0.581*(income share of top 10%) – 1.195*(income share of the bottom 40%) + 0.419*

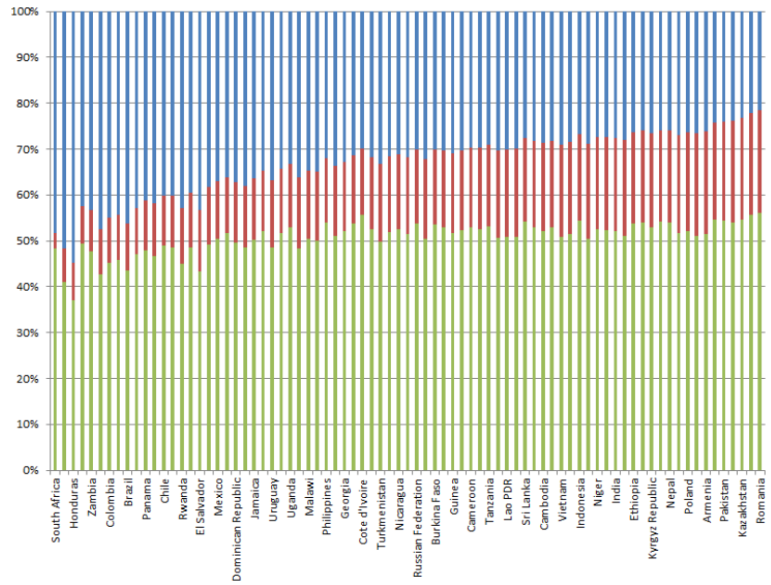


Figure 33 Income share for the lowest 40%, middle 50%, and highest 10% of the income distribution for various countries. *Note: Blue indicates the top 10%, Red indicates the lowest 40%, and Green indicates the middle 50% of the income distribution. Data has been acquired from the World Bank database in 2013. This figure has been obtained from* **(Cobham & Sumner, 2013)**.

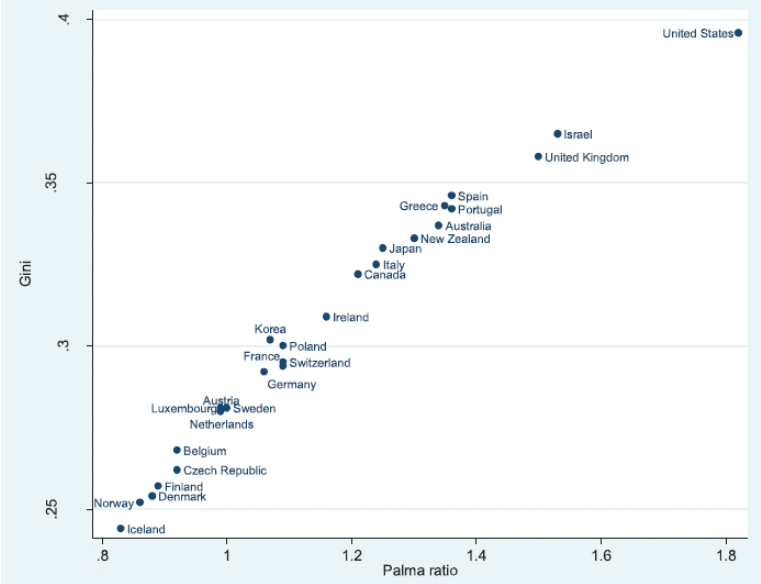


Figure 34 Correlation between the Gini index and the Palma ratio in 2013. *Note: The data is based on disposable income. The results are calculated by the article's author using data from the OECD. This figure has been obtained from* (Tridico, 2018).

Thus, while the Palma ratio only evaluates 50% of the population's income, it can obtain the same information as the Gini index which evaluates 100% of the population's income. One can see this as a confirmation that the middle incomes are relatively stable throughout the various economies causing that the Gini index variations are explained by the variation in the extremes of the distribution. However, as stated by Palma (2011), the middle-income is not necessarily safe from the growth of the top 10%:

> *"… once the bottom 40 per cent has been squeezed almost out of existence, the only way that the seemingly unstoppable 'centrifugal forces' at the top can continue to operate is by squeezing the middle."* – J.G. Palma (2011)

This statement of Palma seems to hold according to the research of Cobaham et al. (2016) finding that the middle income responds to a change in the top income, as shown in Figure 35. However, the analysis did not state a certain transition point after which the middle starts to experience squeezing. The figure predominantly indicates the negative correlation between top and bottom income.

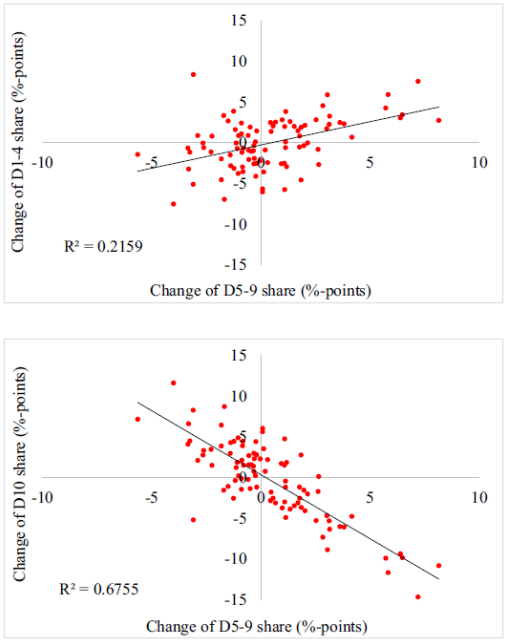


Figure 35 Correlation between middle income or consumption between 1990-2012. *Note: Top window shows the correlation for consumption with the bottom 40% and the bottom window shows the correlation with the top 10%. Results are the author's calculations using data from World Bank in 20015. This figure has been obtained from* **(Cobham, Schlögl, & Sumner, 2016)**.

### Family of poverty indices

Besides the inequality ratios, there is also the family of poverty ratios which investigates the portion of the population which is living beneath certain agreed-upon living standards using (mostly) consumption-related data (Roser & Ortiz-Ospina, 2013). The main interest of this index is that it puts the debate of inequality into the perspective of obtaining a liveable society for everyone without setting moral problems for the rich.

The issue concerning poverty indices is that they are not a well-defined measurement and as a cause of that, different types of thresholds are used to indicate poverty. For example, there are two different manners to create a threshold (University of Oxford, 2019), i.e., an absolute and a relative threshold. Absolute poverty means that there are inadequate financial funds to pay for essential items, such as food, water, and housing. One of the most famous international absolute poverty thresholds is set by the World Bank at $1,90/day. Relative poverty means that an individual is considered to be poor relative to the financial capabilities in society. For example, the OECD considers a person being in poverty when the disposable income is below 50% of the total disposable income of the population (OECD, sd). This is in contrast to the EU which has set the poverty threshold at 50% of the average income or 60% of the median income. Overall, poverty thresholds can differ considerably between countries and mostly relates to the GDP of that country, as shown in Figure 36.

While there is a wide variety of poverty indices, I want to limit the analysis to those that are of greater importance. For this, Handbook on Poverty and Inequality published by The World Bank is used which states that there are four main poverty indices (Haughton & Khandker, 2009), i.e., three which follow from the Foster-Geer-Thorbecke (FGT) index family and the Sen-Shorrocks-Thon index.

The FGT index family relate to the following general equation (Foster, Greer, & Thorbecke, 2010)

$$FGT_\alpha = \frac{1}{N}\sum_{i=1}^{H}\left(\frac{z - y_i}{z}\right)^\alpha$$

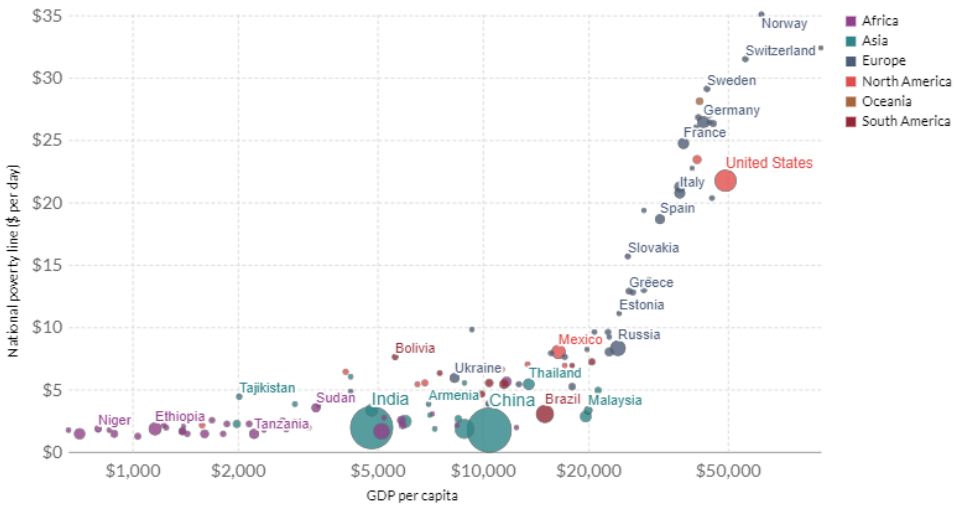


Figure 36 National poverty thresholds for various countries aligned by GDP per capita. *Note: Data has been obtained from the World Bank. This figure has been obtained from* (Roser & Ortiz-Ospina, 2013)

The FGT index is a normalized index, N is the total population size, H is the population size beneath the poverty threshold, z is the poverty threshold, $y_i$ is the $i^{th}$ income, and α is the poverty aversion parameter. Being normalized, $FGT_\alpha$ runs from 0, i.e., having no poverty, to 1, i.e., the max poverty. The input the research needs to give is the poverty aversion, which runs from 0, i.e., maximum aversion to poverty, to infinity, i.e., only the poorest person in society is of importance. Depending on the value of the poverty aversion, the FGT index resolves into the common poverty indices. As to note, poverty aversion parameters α>2 is seemingly rarely used, the reason being that it is less intuitive compared to lower poverty aversion parameters (Foster, Greer, & Thorbecke, 2010):

*Poverty headcount ratio (α=0):* The formula reduces to $FGT_0$=H/N. This index represents the relative size of the number of people beneath the poverty threshold.

*Poverty gap index (α=1):* The formula reduces to $FGT_1 = \frac{1}{N}\sum_{i=1}^{H}\left(\frac{z-y_i}{z}\right)$. This index represents the relative size of the gap between the poverty threshold and the average income (or consumption). In essence, using this formula one can calculate the size of financial resources required to pull everyone out of poverty.

*Poverty severity index (α=2):* The formula reduces to $FGT_2 = \frac{1}{N}\sum_{i=1}^{H}\left(\frac{z-y_i}{z}\right)^2$ This index represents the relative squared size of the gap between the poverty threshold and the average income (or consumption). As such, it puts a higher weight on the people being more impoverished.

Besides the three indices from the FGT family, there is also the Sen-Shorrocks-Thon index which is to be discussed. This index combines the headcount ratio index ($FGT_0$), the poverty gap index ($FGT_1$), and the Gini index of the poverty gaps ($G_p$)

$$P_{SST} = FTG_0 FTG_1(1 + G_p)$$

The relevance of this formula is, that it can answer three relevant questions (Haughton & Khandker, 2009): 1. Are there more poor people?, 2. Are the poor poorer? and, 3. Is there higher inequality among the poor?. One can obtain this by analysing the following equation

$$\Delta \ln(P_{SST}) = \Delta \ln(FTG_0) + \Delta \ln(FTG_1) + \Delta \ln\left(1 + G_p\right)$$

The narrative until this point has mostly focussed on financial aspects, but poverty itself is more difficult than measuring (and altering) income. For example, Rowntree (1901) formulated a clear distinction between primary and secondary poverty based on financial resources. Primary poverty is poverty caused by insufficient income to pay for (all) essential expenditures. Secondary poverty is poverty which is caused by spending too much income on luxury goods by which insufficient funds are left for essential expenditures. Such a distinction in the type of poverty makes the narrative already somewhat more complex, but it can also be doubted whether poverty only revolves around financial resources. There are perspectives which narrate that poverty is to be defined as the absence of resources, these resources can also be education, health, and labour

opportunities (Brady, 2019). Brady (2019) shows that poverty can be explained using three distinct theorems:

1. *Behavioural theory:* causation by incentives and culture
2. *Structural theory:* causation by demographic and labour market
3. *Political theory:* causation by power and institutions hampering policy

An appealing reason to not only review poverty measured by financial resources has been explained by Foster et al. (2010). They explain that the HIV/AIDS pandemic in sub-Saharan Africa predominantly affected the poorer population which caused their life expectancy to be dramatically lower and their relative presence to be diminished. As in result, the financial poverty index measurements decreased, e.g., the poverty headcount ratio decreased as the poor were smaller in size. However, to state that poverty became less important would be the wrong conclusion as it was exactly that, poverty, which caused them to be at higher risk to die because of HIV/AIDS. Moreover, the late 20th century saw a decrease in relative poverty headcount ratio decreased but the absolute number of people in poverty almost doubled, i.e., from 212 million in 1985 (53,4% of the population) to 388 million in 2005 (50,9% of the population) (Foster, Greer, & Thorbecke, 2010). It is questionable what is of greater importance, but one should not lose sight that an indicator only forms a representation of its inputs. Moreover, changes in the index value are also not inherently good or bad, one should review the cause of the change to reach those conclusions.

Overall, Falkingham & Namazie (2002) state that poverty is to be regarded as a multidimensional problem in which financial is just one of the many parameters. Moreover, it could be posed that society should ultimately be concerned about the welfare of the people which tracks more adequately with measures such as happiness and utility than income and wealth (McGregor, Smith, & Wills, 2019). However, the convenience of financial parameters is that they are measured more easily than other parameters which give sway to their usage as a representant of socioeconomic position (Howe, Hargreaves, & Huttly, 2008). Moreover, some theorems perceive humans as logical beings who attempt to maximize their happiness with their financial resources (McGregor, Smith, & Wills, 2019). As such, measuring financial resources could represent the potential of individuals have to be used in the maximization process. However, reviewing humans as pure logical beings could be a stretch…

## 2.3 Chapter conclusion

In this chapter, the quantification and measurement of economic inequality have been reviewed. It has been found that a distinguishment should be made between measuring the underlying data and quantifying the outcome. In the arena of measuring data, three different techniques can be used to retrieve income and wealth data, i.e., tax data, household surveys, and rich lists which, due to their specific (dis)-advantages, should be used conjointly to optimize the quality of the data.

However, the general returning issue is that the top of the income and wealth distributions are more intensively (and successfully) attempting to avoid and evade supplying their complete income and wealth data. This leads to problems of governments having misperceptions about the size of the economic inequality within their nation.

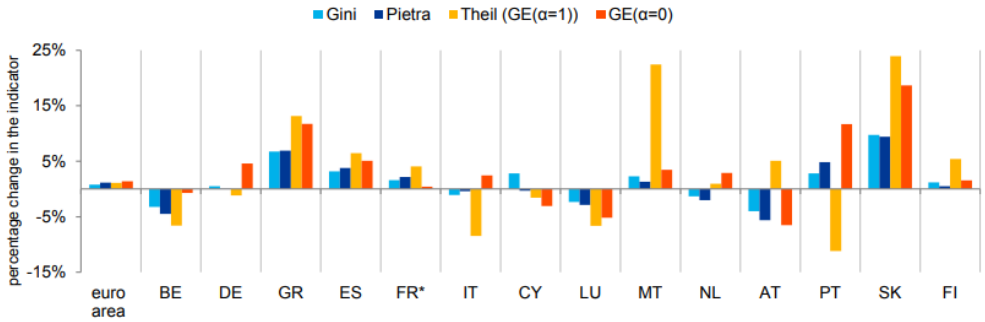


Figure 37 Change in inequality according to various inequality parameters for various countries. *Note: Results are based upon authors' calculations using data from the HFCS using (mostly) data between 2010-2014. This figure has been obtained from* (Costa & Perez-Duarte, 2019).

Moreover, there are difficulties in the interpretation of data because of differences in exact definitions of income & wealth and differences in the unit of analysis, i.e., on an individual or household level. It requires rigour and vigilance to obtain data sets that use the same type of data to be able to perform meaningful comparisons between those data sets.

As for the quantification of inequality, there are various options to measure inequality within a society. Every type of quantification has its specifications and, therefore, should be used depending on the purpose of the analysis. I cannot formulate an a priori hierarchical ranking for the best and worst methods of representation of inequality. The general statement would be it seems ill-advised to use one single quantification method, as it will be biased in some manner. Therefore, it would be preferred to use inequality indices conjointly to obtain a more comprehensive view of the inequality within a society. This is also advised as the different indices can lead to different interpretations of the economic inequality, as shown in Figure 37.

As a last remark, I would like to warn against using inequality indicators as a method to measure the effects of specific events, e.g., newly introduced policies, economic events, and natural disasters. The economy is a tremendously complex system with various portions of society being interconnected and, as such, stating that a specific event is the specific cause for a change in an inequality parameter would be oversimplifying the system. Moreover, one can debate if a change in a specific inequality indicator should be the goal of a policy or that would like to change other (connected) parameters, e.g., health, education, democracy, and economic growth.

### Conceptual model's building blocks

To complete the analysis for this chapter, the following 'building blocks' have been synthesized for the conceptual model.

## Data collection

*a. Undocumented inequality – Taxes & Benefits*

Undocumented inequality leads to wrongfully administered tax rates and supplied benefits.

*b. Undocumented inequality – Tax Avoidance & Evasion*

Tax avoidance & evasion leads to unknown data which causes the inability to measure inequality.

*c. Tax Avoidance & Evasion – Financial Resources*

People with greater wealth or income have improved capabilities to withhold information concerning taxed assets or income.

*d. Undocumented inequality – Data Collection*

Every type of information source on economic inequality has its limitations in assessing economic inequality. It would be advised to bundle different information sources to limit the amount of undocumented inequality.

*e. Undocumented inequality – Measurements*

Due to undocumented inequality, there is missing data which leads to incomplete measurements.

## Quantifying inequality

*a. Measurements – Policy Approval*

It is of core essence to realize that the measurements (and sequential indices) have their specific limitations. It would be ill-advised to devise policies based upon a single index; they should be used coherently.

## 3. Economic inequality – How does money flow?

Having reviewed the harmful impacts of economic inequality and how it can be measured, the following aspect is "What is the cause of economic inequality?". For this, it is of importance to understand that economic inequality is the overarching term combining income, wealth, and opportunity inequality. I will use the umbrella term financial resource when reviewing the combination of income and wealth inequality with each having its characteristics, as shown in Figure 38.

However, the interconnecting factor between income and wealth is that wealth can generate income which aids income inequality. This can be conceptualized by creating a distinction between income from labour and capital (wealth) per person/household. Piketty (2014) has shown that the share of income from capital (wealth) increases with increasing income, as shown in Figure 39. These kinds of differences have important implications for the potential policies which can be drafted to alleviate income inequalities. For example, if 100% taxation would be applied to income from capital, then the top 0.01% would have a reduction in income of almost 60% while the 90-95$^{th}$ percentile would only have a loss of approximately 5%. This would be a simple theoretical policy to equalize income using the difference in the source of income.

Next to income and wealth inequality there is opportunity inequality, which is mostly reviewed by economic mobility, i.e., the ability to change one's income and wealth. This is of importance as it describes the ability of a person to move up or down the (socio-)economic ladder and, therefore, also has the capability of altering economic inequality. As will be argued during this chapter, high mobility can potentially be more important than income or wealth inequality.

Overall, I will untwine the concepts of income and wealth inequality by reviewing the basic principles causing them. This can aid in understanding why these two types of inequality are occurring and can give indications as to which policies can be drafted to

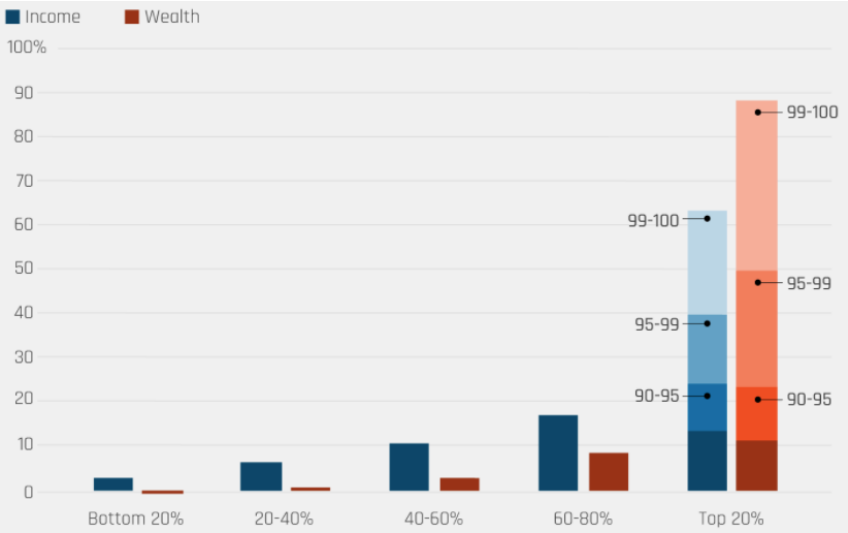


**Figure 38 Income and wealth distribution quintiles in the United States in 2016.** *Note: The results are based upon the article's author's calculations using data from the Federal Reserve Board (Survey of Consumer Finances) in 2017. This figure has been obtained from* **(Leiserson, McGrew, & Kopparam, 2019)**.

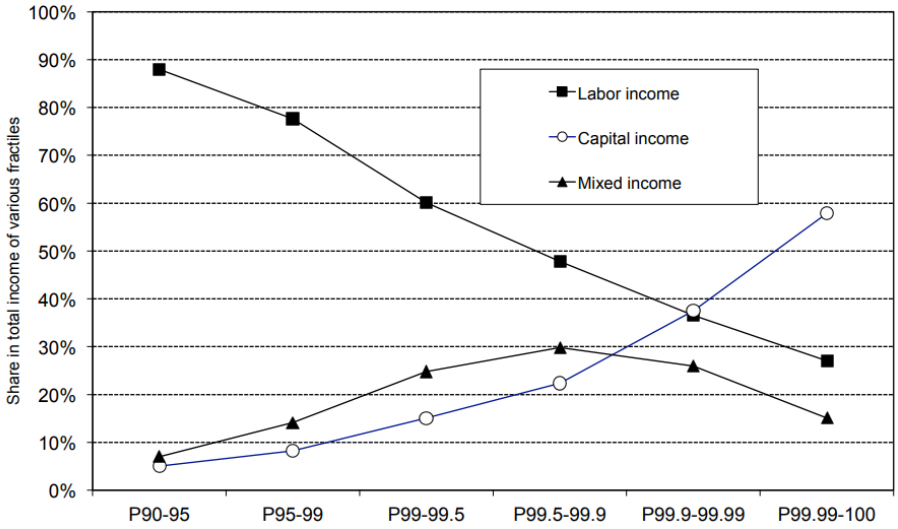


**Figure 39 Composition of top income in France in 2005.** *Note: This figure has been obtained from* **(Piketty, 2014)**.

influence these inequalities. After this, opportunity inequality and the underlying term mobility will be discussed. This chapter will conclude with some overarching statements and provide the contributions made to the conceptual model.

## 3.1 Income Inequality

As of late, income inequality is obtaining more attention as the increase in income inequality since the 1980s seems to be continuous (Alvaredo, Chancel, Piketty, Saez, & Zucman, 2018). An example of this trend is shown in Figure 40, representing a progression of highest incomes while median and low-incomes were falling behind. Interestingly, the 1980s also is marked by a change in where inequality is coming from. The global income inequality, i.e., the relative inequality of incomes among all peoples of the world ignoring where they live, originated before the 1980s from growing differences between country and were dampened by reducing differences within countries. However, after the 1980s global income inequality is caused by growing differences within countries and is dampened by reducing differences between countries (Ravallion, 2018). Garcia-Penalosa

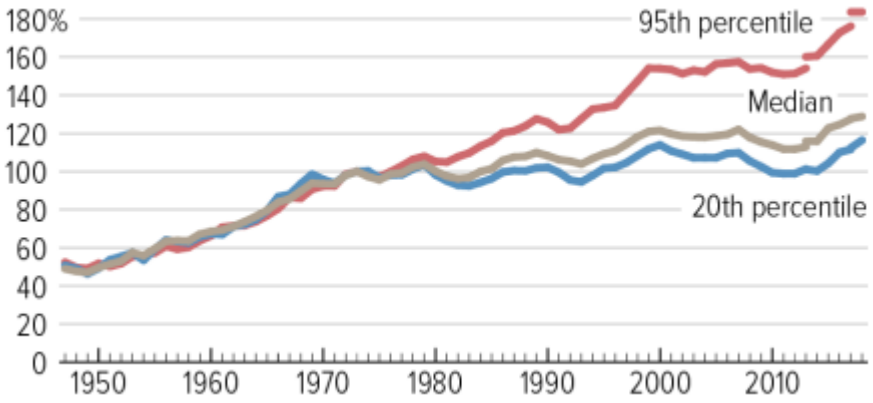


**Figure 40 The discrepancy in the growth of income between high, median, and low income, in the United States.** *Note: The graph shows data from 1947-2018 and is normalized based on income in 1973. Results are based on the Center on Budget and Policy Priorities (CBPP) using data from the U.S. Census Bureau Data. Small anomalies around 2013 and 2017 are consequences of a redesigned questionnaire and updated data processing respectively. This figure has been obtained from* **(Stone, Trisi, Sherman, & Beltran, 2020)**.

& Orgiazzi (2013) are hinting that this with-in country rise in inequality is (partly) caused by an increase in income inequality within age groups. This is an important notion as it could indicate that a portion of the population is gaining economic benefits within a country while others are being left behind.

The importance of the finding of Ravallion (2018) is that, if inequality currently is on the rise within a nation, the potential solutions could also be residing within those nations by drafting national policies. I envision, maybe falsely, that attempting to change the inequality within a nation will be easier than resolving inequalities between nations as that would require negotiating bilateral treaties. However, before becoming too optimistic about a possible change, it is required to first understand the current causes of income inequality before being able to devise policies opposing it.

For this thesis, the causes of income inequality will be discussed following the distinction made by Stansbury & Summers (2017) being 1. a decreasing labour share of income, and 2. diverging income between high and low wages. They reach this conclusion by analysing the progression of income and labour productivity, shown in Figure 41. Their narrative is that the difference in income growth between production/non-supervisory jobs (representing 80% of the workforce) and the average income after the 1970s is occurring due to differences in high and low wages. But the difference between labour productivity and average income, diverging from each other after the 2000s, is caused by a reduction in the labour share of income (or put differently, an increase of the capital share of income).

However, it should be acknowledged that various other perspectives can be chosen for the analysis of income inequality. For example, Kaasa (2005) used five different parameters: 1. Economic development, 2. Demographic factors, 3. Political Factors, 4. Cultural and environmental, and 5. Macroeconomic. Whereas Sharpe et al. (2008) attempted to clarify income inequality using four different parameters: 1. increase in non-wage income, 2. rise in income inequality, 3. decrease in labour's term of trade, and 4. fall in the share of labour income. While Kaasa (2005) and Sharpe et al. (2008) use different

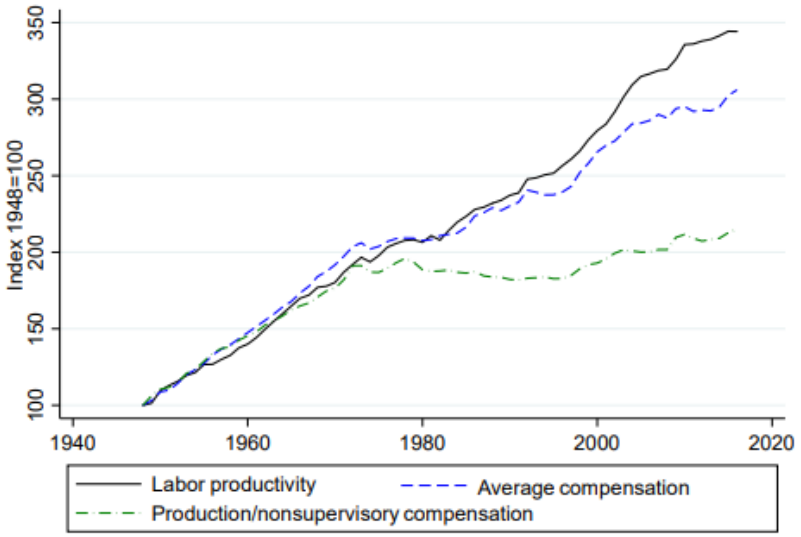


**Figure 41 Labour productivity compared to average labour compensation and production/non-supervisory compensation.** *Note: The results are shown for the USA between 1948-2016 with data retrieved from BLS, BEA, and Economic Policy Institute. This figure has been obtained from* **(Stansbury & Summers, 2017)**.

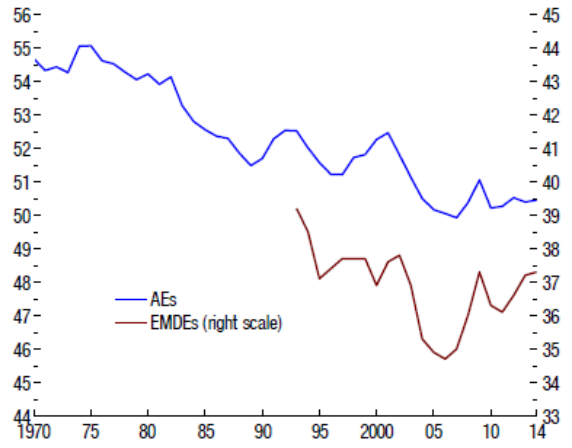


**Figure 43 Share of labour income over the past decades for both advanced and developing countries.** *Note: AEs represent advanced economies and are averaged by the weighed nominal GDP. EMDEs represent the emerging market and developing economies and are averaged by normalized year fixed effects which are weighted by least squares regressions using nominal GDP. The results are based upon data from the CEIC database,* **(Karabarbounis & Neiman, 2014)**, *national authorities, OECD database, and IMF calculations. This figure has been obtained from* **(Dao, Das, Koczan, & Lian, 2017)**.

classifications, their separate arguments will largely return when applying the parameters used by Stansbury & Summers (2017). As such, using Occam's razor, the simpler version of Stansbury & Summers (2017) will be chosen but depending on the researcher's perspective, another classification can certainly be justified.

### Decreasing labour share of income

Market income can be divided into a labour share of income and a capital share of income. In a recent article of the IMF (Dao, Das, Koczan, & Lian, 2017) it has been stated that the relative importance of the labour share of income has decreased, as shown in Figure 43, when compared to the capital share of income. However, such an analysis neglects that income gains a third income source, i.e., the benefit share of income, when reviewing the total income. This source of income has steadily been becoming more important after the Second World War, increasing to 15-20% of total income (Piketty, Saez, & Zucman, 2018), as shown in Figure 42. Problematic to the analysis of benefits is that it represents a state/institutional supplied income which attempts to correct for inequalities. As such one can question whether benefits are a cause of the decrease in the labour share of income or attempts to fix the decrease in the labour share of income. Moreover, benefits are a cornerstone piece in the direct redistribution policy next to the taxation policies. As such, it has been chosen

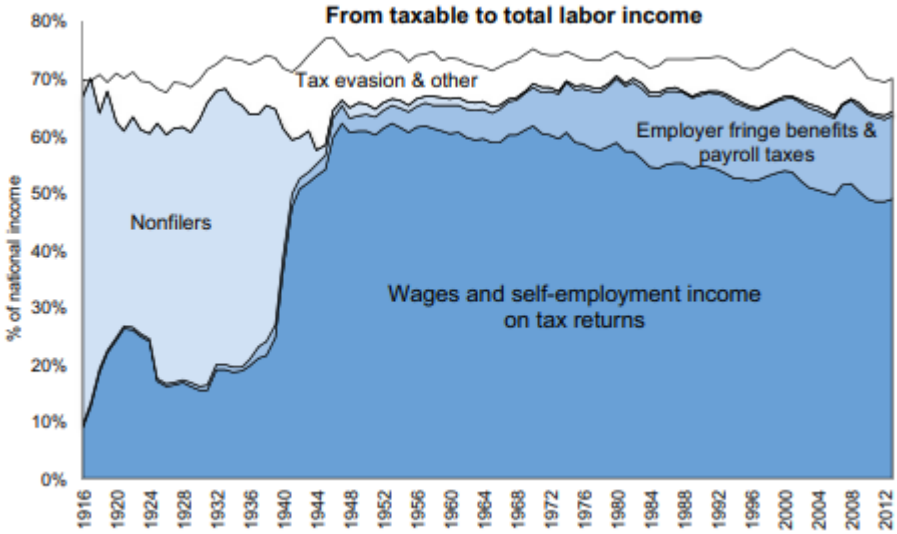


**Figure 42 Origin of taxable income for the United States from 1916-2012.** *Note: This figure has been obtained from* **(Piketty, Saez, & Zucman, 2018)**.

to discuss labour and capital income in this chapter and will return on benefits in Chapter 4: *Redistribution policy – One for all, and all for* one?.

When reviewing the labour share of income, it can be found that changes have been occurring due to developments in the global economy (Stockhammer, 2017). This can largely be summarized by three causes: 1. Technological changes, 2. Globalization, and 3. Capital accumulation[9]. These aspects have potentially caused that the current economy is less labour intensive as compared to the past. Besides giving these three parameters a more in-depth analysis, the concept of elasticity of substitution will also be reviewed as it connects labour and capital income by the substitution of the one into the other.

Before going into depth into the three causes, it should be remarked that the decline in labour share income is a stylized effect of averages across industries and nations (Dao, Das, Koczan, & Lian, 2017). Some nations and industries even saw an increase in labour share income, as shown in Figure 44. However, the estimates are yet again an average for the developments within the particular industry. For example, the average labour share for agriculture is positive but for developing countries this was negative while it was positive in developed countries.

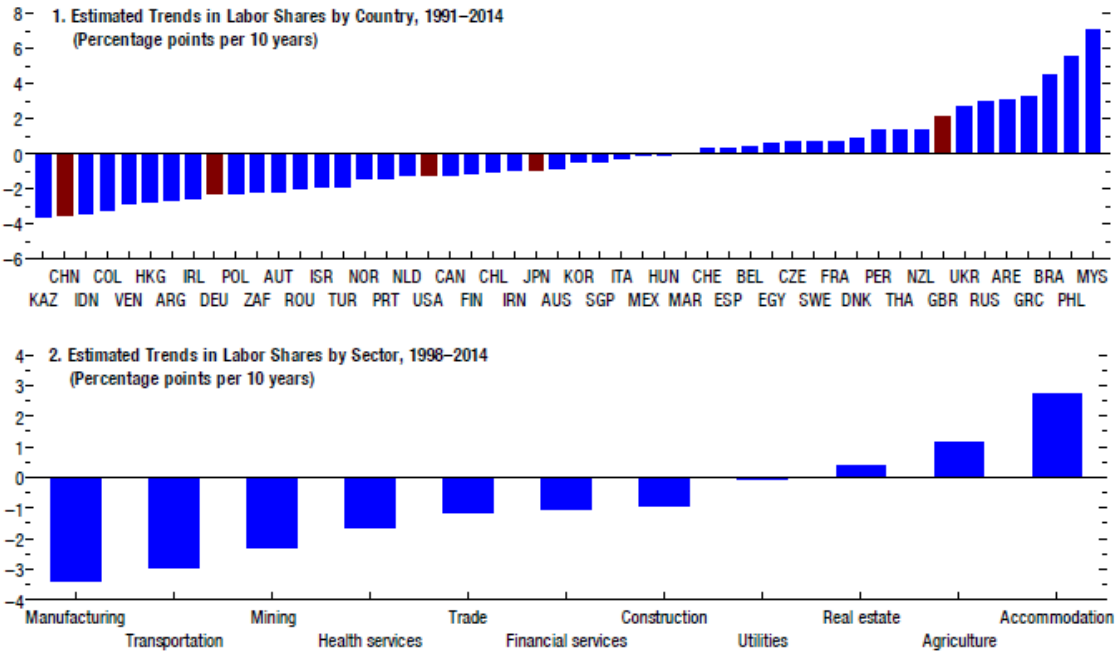


**Figure 44 Changes in labour share income for various nations and industries.** *Note: The top panel shows trends per country with the five largest economies highlighted in red. The bottom panel shows trends per industry sector. The results are based upon data from the CEIC database,* **(Karabarbounis & Neiman, 2014)**, *national authorities, OECD database, and IMF calculations. This figure has been obtained from* **(Dao, Das, Koczan, & Lian, 2017)**.

### *Elasticity of substitution*

Income from labour and capital are interconnected by the elasticity of substitution. The elasticity of capital-labour substitutions indicates the percentage change in the ratio

[9] Stockhammer (2017) also refers to welfare state entrenchment which this thesis discusses in the subsection Diverging Income as, following another perspective, it is more aptly discussed in that section. Moreover, Stockhammer (2017) refers to financialization which will be discussed in as capital accumulation, it being the contributor to investment of financialization.

of capital to labour (K/L or capital intensity) in response to a change in the ratio of the wage rate (W) to the price of capital (Pk) by 1 percentage point and is described as follows:

$$s = \frac{\Delta(\frac{K}{L})/(\frac{K}{L})}{\Delta(\frac{W}{Pk})/(\frac{W}{Pk})}$$

The value of the elasticity ranges from 0 to infinity with an important pivot point at 1. When the elasticity of substitution is >1 then labour and capital are gross substitutes and when the elasticity of labour is <1 then they are gross complements. Gross substitutes (complements) mean that the ratio of capital to labour (K/L) will increase (decrease) by more than 1% if the relative price of labour (W) to the price of capital (Pk) increases (decreases) by 1%. As such, this would indicate that capital causes positive (negative) returns and thus the accumulation (dissipation) of capital (Piketty, 2014).

There have been various attempts to calculate the average elasticity of substitution for a whole economy with varying outcomes. For example, Knoblach & Stöckl (2020) and Muck (2017) showed that the elasticity of substitution is <1, with the latter showing an average of 0.7 for 12 advanced economies. This would mean that capital is a gross complement and capital investments should be labour augmenting. However, Piketty (2014) and Karabarbounis & Neiman (2014) showed that the elasticity of substation is >1, with results finding that the elasticity of substitution would be 1.3-1.6 and 1.25 respectively. According to them, capital would be capital augmenting and, as such, would be self-expanding.

Overall, the values for the elasticity of substitution are being debated. When reviewing the previously mentioned articles they all give their scientific reasons as to why their elasticity value should be the true one. Mostly these differences are caused by a different perspective of analysis and the assumptions made. For example, the International Labour Office (ILO) (2019) shows that the elasticity of substitution for the whole distribution is differently impacted upon a 1% increase in wage for the top 5%, as shown in Figure 45. In a broader perspective, Knoblach & Stöckl (2020) have shown that the elasticity of substitution varies as a function of 1) industry, e.g., <0.8 for manufacturing and service industry while for the agricultural industry it is >1.5, 2) time-dependent, e.g., over the past decades the elasticity of substitution became larger, and 3) country-country specific, e.g., the value being 0.03 for Burundi and 2.18 for Hong Kong. However, for the overall trend, The International Labour Office (2019) states that the share of labour income is decreasing. It will be a matter of perspective of which value

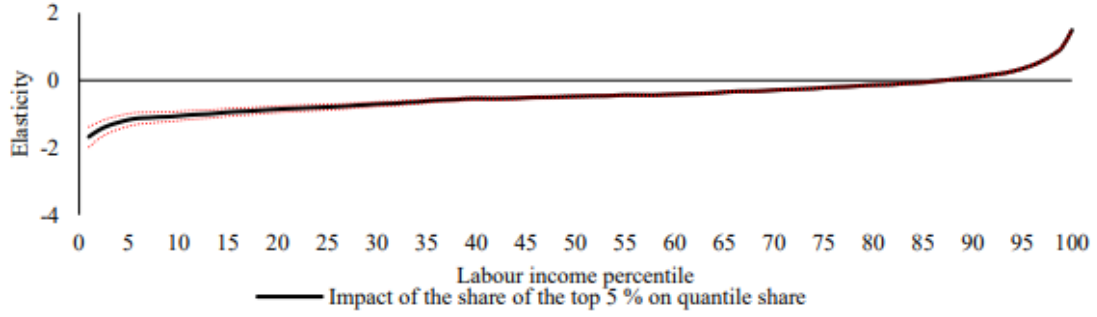


**Figure 45 Elasticity of substitution varying according to income percentile upon a 1% labour share income increase for the top 5%.** *Note: This figure has been obtained from* **(ILO Department of Statistics, 2019).**

elasticity is connected to this value. However, from the perspective of this thesis, the results of the ILO (2019) indicate that labour is becoming of lesser importance to total income which impacts the lower income percentiles more harshly than the higher income percentiles.

### *Technology*

An intermediary between labour and capital is technology. Through technological developments, new (capital) investment opportunities are created which can increase labour productivity. While in the past technological development was (mostly) concerned with the creation of physical capital goods such as machines, since the occurrence of ICT technological development also has large branches into the digital realm. This has vastly changed the return on capital as it creates the opportunity to create additional content with a marginal increase in labour input. This is caused by the fact that digital content can be duplicated without additional investment costs. As such, a single investment can create an unlimited amount of output. According to Karabarbounis & Neiman (2014), the ICT developments caused that capital investment costs have been reduced by 25% which explains up to 50% of the decline of the labour share as the return on capital investment increased. They see their reasoning solidified as the decrease in labour share has been occurring for 90% within the industries and not by changes between industries.

In regards to the requirement of human capital, it is important to make a distinction between technological innovation, giving an increase in labour income, and technological mechanization, giving a decrease in labour income (Guerriero & Sen, 2012). Reasons for this can be that technological innovation requires large human capital for research which promotes highly educated labourers with high incomes. This is in contrast to technological mechanization which causes a decrease in labour share. For this, the reasoning is that machinery substitutes labour-intensive (low-wage) jobs and increases the return on capital. According to Guerriero & Sen (2012), this could also explain differences between developed and developing countries, as the former mainly experience technological innovation while the developing countries are experiencing technological mechanization.

### *Globalization*

Another "recent" large occurrence in the world economy is the process of globalization. This is an overarching term for deepening/intensification of various aspects, e.g., trade, capital mobility, finance mobility, and labour mobility (Tridico, 2018). The interaction between globalization (more specifically capital and labour mobility) and income is explained by the Stolper–Samuelson theorem which states that countries will specialize in being either labour- or capital-intensive economies. Capital-intensive nations will specialize in such a type of economy (developed countries) and vice versa for labour-intensive countries (non-developed countries) (Hogrefe & Kappler, 2013). The theoretical explanation of these effects goes as follows. Companies in capital-intensive (developed) countries can create a threat to out-source labour-intensive jobs to labour-intensive (developing) countries. This causes workers in labour-intensive jobs within developed countries to experience lower bargaining power and as a result, they must accept lower wages. This is in contrast to workers in capital-intensive jobs who gain increased demand from labour-intensive countries shifting their capital-intensive jobs towards them. All

taken together, a discrepancy occurs between the incomes of these two groups of workers and depresses labour income in capital-intensive countries.

The narrative is confirmed by Guerriero & Sen (2012) showing that the effect of globalization on the share of labour income is dependent on the state of the economy. As such, OECD countries, i.e., developed countries, experience a reduced share of labour income with increasing globalization as it transfers labour-intensive work towards cheaper labour force countries, mostly developing countries. As the labour-intensive jobs are being transferred, the remaining jobs will on average be more capital-intensive and thereby the labour share decreases. This contrasts with developing countries which experience an influx of labour-intensive jobs which increases the share of labour income (Guerriero & Sen, 2012).

Another consequence of globalization is that it represses the welfare state according to the 'efficiency thesis' (Tridico, 2018). This thesis revolves around the notion that a welfare state requires large public revenues to support social support which in turn requires increased taxes. The increased taxes create larger costs to corporations which makes a welfare state more expensive to operate than a non-welfare state. As such, due to increased competition between countries caused by globalization, countries justify decreased expenses to the welfare state, i.e., the retrenchment of the welfare states as shown in Figure 46, to attract labour and capital from companies. However, Tridico (2018) explains that globalization can also cause an opposing effect coined as the 'compensation thesis'. This thesis states that the welfare state will increase expenses as a response to rising inequality caused by globalization. It is uncertain which thesis dominates. For example, in Scandinavian and Continental countries the 'compensation thesis' seems to fit while in Anglo-Saxon and Mediterranean countries the 'efficiency thesis' seems to be a better fit (Tridico, 2018). As such, it cannot be said that globalization has a single straightforward impact on economic inequality and differences occur between countries.

Another important consequence of globalization is that it has caused increased mobility of financial resources which impacted financialization. Baud & Durand (2012), found that large corporations could abuse the possibility to move financial resources across borders enhancing financialization opportunities and increasing their return on

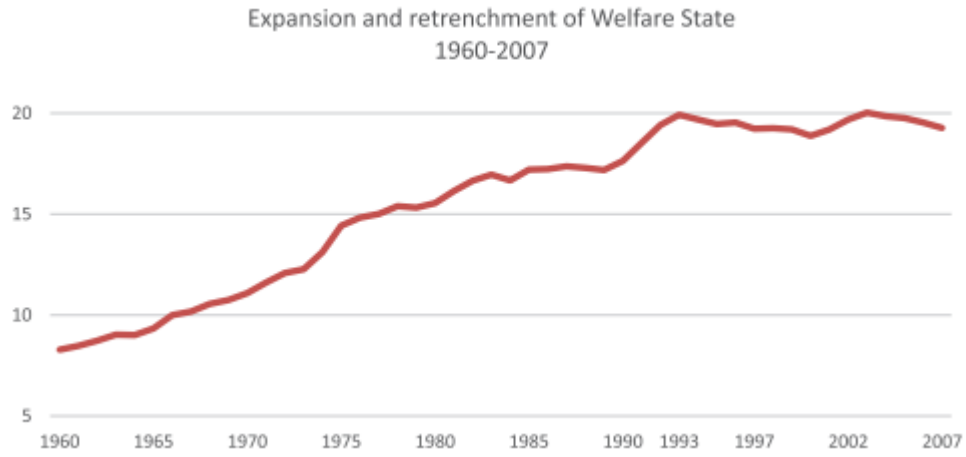


**Figure 46 Retrenchment of the welfare state.** *Note: The results are shown as an aggregate of 23 OECD countries between 1960-2007 based on data from the OECD. The results are based upon the article's author's calculations using the OECD database. This figure has been obtained from* **(Tridico, The determinants of income inequality in OECD countries, 2018)**.

equity. Problematic to this incentive is that asset financialization diverts attention from goods & service production causing the position of low-wage workers to be weakened. Moreover, the interaction between globalization and financialization has granted corporations the ability to create financial construction to be used for tax avoidance by abusing different tax regulation laws (Evertsson, 2016). Overall, it has been stated by Van der Zwan (2014) that financialization has been hurting equality and has suppressed low-wage workers while high-wage workers have seen the advantages.

### *Wealth accumulation*

Income from capital/wealth is an interesting source of income. The idea is that the existence of wealth can create more wealth when invested. Piketty (2014) reviewed this process on a national level by describing income from capital (α) as the multiplication of the return on capital *(r)* by the amount of national capital owned per amount of national income (*β*)

$$\alpha = r * \beta$$

As such, the income from capital is dependent on the two parameters, i.e., r and ß, and the interaction between the two parameters, which is described by the (aforementioned) elasticity of substitution (Piketty, 2014). This simple formula shows that overall income from capital can increase when either the rate of return increases or a larger amount of wealth (per unit of national income) is owned. However, this only occurs with the prerequisite that growth in one parameter is not offset by a larger decrease in the other parameter, which will always be true if the elasticity of substitution is 1 or larger.

While Piketty (2014) performed his review on the national level, the story behind economic inequality and wealth accumulation becomes clearer by reviewing the income and wealth distribution on a percentile level. It has been shown earlier in Figure 38 that the amount of wealth owned has a large unequal distribution. However, the returns on capital were not yet investigated. In the analysis of Advani et al. (2021), they reviewed the type of assets according to the wealth distribution. They found that the number of assets with zero return progressively diminishes along with the wealth distribution, as is shown in Figure 47. As such, one finds that with increasing wealth, increasing returns can be obtained, which in the least will not reduce economic inequality.

The size of return on capital and size of wealth becomes easier to interpret when reviewing the wealth composition. Azpitarte (2010) performed an in-depth analysis and showed that stock ownership is a common item in the top 10% (44,1% have stocks) while it is an anomaly for the poorest 10% (0,4% have stocks), as shown in Figure 48. The financialization of assets becomes even starker realizing that the poorest 10% have almost 90% of their financial assets in bank accounts while for the top 10% this is just smaller than 25%. When reviewing the current returns, a bank account gets up to a maximum of 0,3% of interest (Actuelerentestanden.nl, 2022) while on average the yield on stocks is 7% (LangzaamRijker.nl, sd). This contrast in asset composition and asset size indicates that it will increase economic inequalities by its mere nature.

The increase in income inequality because of wealth accumulation has been connected to the rise in financialization which soared in the second half of the 20th century (Davis & Kim, 2015). In the USA the size of finance went from 15% of GDP in the

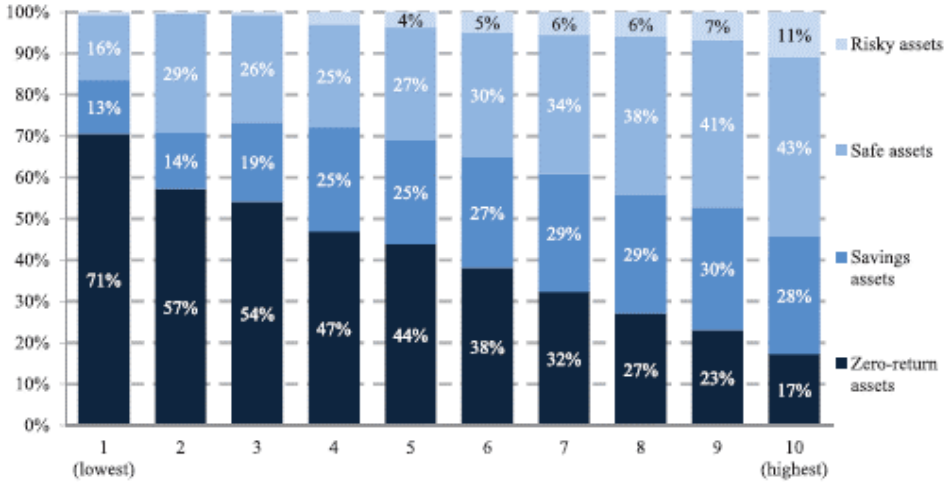


**Figure 47 Composition of family assets in Great Britain between 2016-2018.** *Note: Zero-return assets include cash, current bank accounts, and other informal financial assets. Saving assets include interest-bearing sight deposit accounts and national savings products. Safe assets include tax-free interest savings accounts (ISA accounts) and formal financial assets. Risky assets include shares and bonds. Data has been obtained from the WAS in 2020. This figure has been obtained from* **(Advani, Bangham, & Leslie, 2021)**.

1960s to 23% of GDP in 2001. To put it in starker terms, the size of finance (in GDP) surpassed the size of the "regular" industry by the 1990s (Davis & Kim, 2015). Van der Zwan (2014) states that financialization caused an increased focus on profits for the investors and stagnated wages for wage-earners and increased indebtedness among households. This effect is not only present in the finance sector. Lin & Tomaskovic-Devey (2013) state that financialization also had a profound effect on the non-financial sector

| | Portfolio composition (percent of total assets) | | | | | | | Percent of owners | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | All | Bottom 10 % | Next 20 % | Next 20 % | Next 20 % | Next 20 % | Top 10 % | All | Bottom 10 % | Next 20 % | Next 20 % | Next 20 % | Next 20 % | Top 10 % |
| ***Real Assets*** | 88.3 | 89.2 | 89.6 | 93.7 | 92.8 | 90.8 | 82.9 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Principal residence | 52.2 | 21.8 | 59.6 | 71.1 | 69.2 | 58.7 | 34.2 | 81.9 | 6.4 | 68.9 | 95.3 | 96.7 | 97.7 | 95.8 |
| Other state properties | 18.6 | 7.6 | 6.0 | 5.6 | 9.2 | 17.5 | 29.2 | 30.1 | 2.7 | 12.1 | 18.5 | 29.4 | 50.4 | 77.8 |
| Durables and collectibles | 7.6 | 42.8 | 16.2 | 11.2 | 8.9 | 6.9 | 4.7 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Business equity | 6.6 | 1.3 | 0.5 | 1.2 | 1.5 | 4.3 | 12.9 | 11.5 | 2.1 | 2.7 | 6.7 | 9.0 | 20.0 | 35.5 |
| Vehicles | 3.3 | 15.7 | 7.3 | 4.6 | 4.1 | 3.3 | 1.9 | 73.7 | 46.8 | 60.6 | 71.5 | 80.1 | 86.9 | 92.6 |
| ***Financial Assets*** | 11.7 | 10.8 | 10.4 | 6.3 | 7.2 | 9.2 | 17.1 | 98,5 | 92.7 | 98.8 | 98.6 | 99.1 | 99.6 | 99.9 |
| Bank accounts | 4.6 | 8.8 | 8.4 | 4.3 | 4.3 | 4.6 | 4.1 | 98.2 | 91.6 | 98.7 | 98.3 | 99.0 | 99.4 | 99.6 |
| Stocks | 3.2 | 0.0 | 0.5 | 0.3 | 0.6 | 0.8 | 7.3 | 12.5 | 0.4 | 3.1 | 5.7 | 10.9 | 20.6 | 44.1 |
| Private pension assets | 1.7 | 1.5 | 0.7 | 0.9 | 1.1 | 1.9 | 2.3 | 23.1 | 5.1 | 8.0 | 18.5 | 24.7 | 36.1 | 51.0 |
| Investment funds | 1.1 | 0.0 | 0.4 | 0.2 | 0.5 | 1.0 | 1.9 | 7.2 | 0.0 | 2.3 | 2.9 | 6.4 | 12.5 | 24.2 |
| Bonds | 0.2 | 0.0 | 0.1 | 0.1 | 0.2 | 0.4 | 0.2 | 1.9 | 0.0 | 0.4 | 1.0 | 1.6 | 4.6 | 3.7 |
| Other financial assets | 0.8 | 0.5 | 0.3 | 0.5 | 0.4 | 0.4 | 1.4 | 5.4 | 4.0 | 3.4 | 4.4 | 3.8 | 5.4 | 16.1 |
| *Total* | 100 | 100 | 100 | 100 | 100 | 100 | 100 | | | | | | | |
| ***Debts*** | 7.7 | 48.8 | 22.2 | 15.1 | 8.7 | 5.4 | 4.0 | 43.6 | 25.1 | 40.0 | 51.6 | 45.3 | 45.7 | 45.6 |
| Principal residence | 4.3 | 14.2 | 16.6 | 10.8 | 5.9 | 2.6 | 1.2 | 21.6 | 3.0 | 21.9 | 29.2 | 26.4 | 20.3 | 17.1 |
| Other state properties | 1.8 | 9.4 | 2.0 | 1.4 | 1.3 | 1.5 | 2.2 | 6.5 | 1.0 | 2.2 | 3.3 | 5.3 | 10.7 | 20.9 |
| Vehicle loans | 0.4 | 3.9 | 1.5 | 1.0 | 0.5 | 0.3 | 0.1 | 11.6 | 7.7 | 11.8 | 16.0 | 10.0 | 12.4 | 7.4 |
| Installment debt | 0.4 | 8.6 | 0.2 | 0.2 | 0.3 | 0.4 | 0.3 | 1.9 | 0.7 | 0.6 | 1.1 | 1.8 | 3.4 | 4.6 |
| Other debts | 0.7 | 12.8 | 1.8 | 1.6 | 0.6 | 0.5 | 0.3 | 13.6 | 15.9 | 11.3 | 12.3 | 9.7 | 8.3 | 6.5 |
| Net equity principal residence | 47.8 | 7.7 | 43.0 | 60.3 | 63.2 | 56.2 | 33.0 | 81.9 | 6.4 | 68.9 | 95.3 | 96.7 | 97.7 | 95.8 |
| Net equity other state properties | 16.8 | -1.8 | 4.0 | 4.2 | 7.9 | 16.0 | 27.0 | 30.1 | 2.7 | 12.1 | 18.5 | 29.4 | 50.4 | 77.8 |

**Figure 48 Composition of household wealth.** *Note: Results are based upon the article's author's calculations using the EFF database in 2002. This figure has been obtained from* **(Azpitarte, 2010)**.

influencing income inequality. From their analysis, they find that financialization incentives caused up to half of the decrease in the labour share of income, about a tenth of the increase in managerial wages, and increased income inequality in the non-finance sector.

In essence, increased financialization is correlated with increasing income inequality (Roberts & Kwon, 2017) and this correlation has been increasing over time (Zalewski & Whalen, 2010). According to Stockhammer (2017), financialization has been the greatest contributor to the decline in the labour share of income between 1970-2007 in 71 countries overall when compared to globalization, technological change, and welfare state entrenchment. According to Roberts & Kwon (2017), the effects of financialization on inequality become worse in countries with weak social (labour) security. This is caused by the fact that bargaining power is decreased, and the wealthy can turn the disorganised low-wage class in favour of their income. These advantages are, in turn, mostly accrued by the top 1% of income of the nation. Overall, Tridico (2012) concludes that financialization has caused soaring corporate profits and high rates of return on financial assets at the cost of job insecurity and income inequality.

### Diverging income

Income inequality does not only occur because the labour share of income has been decreasing, but there has also been a stable increase in a stretching income distribution, i.e., higher incomes increased their earns while low-incomes were lagging. The problem with this occurrence is that there seemingly is a self-reinforcing trend which is aptly captured by Malloy (2020) in the following quote:

> *''However, as the relative economic power of labour declined and that of the top 1% increased, so too did the political power shift. This becomes a vicious cycle in which economic resources are translated into political power and policies are put in place that favor the top 1%. This can lead to policies that further erode labor's bargaining power, keeping top marginal tax rates low, eroding the value of the real minimum wage, and making it difficult for workers to organize.''* – L.C. Malloy (2020, p. 20)

When reviewing the divergence of incomes in general terms, one can state that divergence can occur by either the running away of the top income, the lagging behind of the bottom incomes, or a combination of both. Most probably this latter perspective, being a combination of various factors, is the most likely when reviewing the results of Jones (2015). He showed that the top incomes obtained a spur in income growth rate after the 1980s while the others saw a reduction in income from that period, as shown in Figure 49. This is an important notion, as reducing income inequality will involve altering the conditions at both ends of the spectrum and not only reviewing the rich or the poor.

There are various perspectives as to why income divergence is occurring. For example, Malloy (2020) states that the increasing income inequality is caused by a reduction in bargaining power, i.e., employees have more difficulties demanding higher wages. This process is a difficult interplay of various parameters of which several are shown in Figure 50. This is in contrast to Bakija et al. (2012), which explained increasing income inequality as a consequence of seven different parameters: 1. the Stolper-

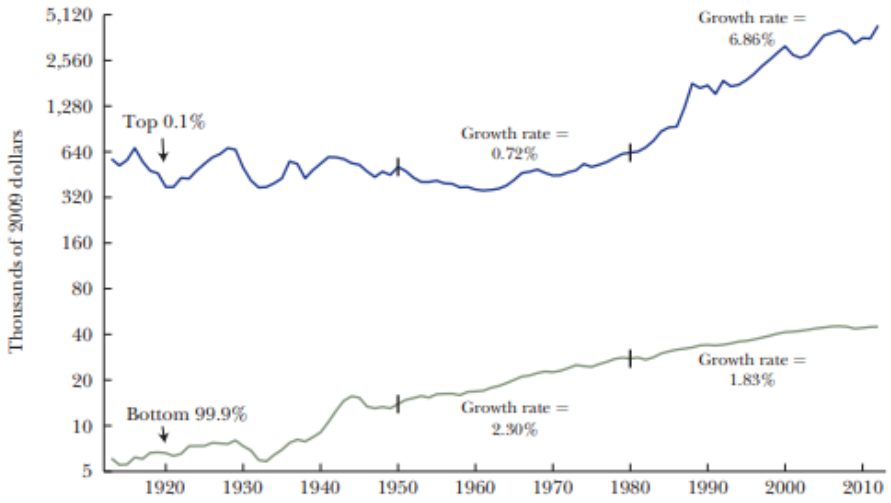


**Figure 49 Income growth rates for the top 0,1% and the bottom 99,9%.** *Note: The data represents growth rates for the top 0,1% (blue line) and bottom 99,9% (green line) in the period from the early 20th century up to the early 21st century. The growth rates are reported for the period 1950-1980 and 1980-2007, The results are based upon the article's author's calculations using data from (Angus) Maddison Historical Statistics (pre-1929 period) and Bureau of Economic Analysis (post-1929 period) for the 99,9% income population and the top 0,1% using the World Top Incomes Data Base. This figure has been obtained from* **(Jones C. I., 2015)**.

Samuelson theorem, 2. Technology-enhanced effects for top income, 3. Superstar theorem, 4. Financialization of pay-out in executive wage, 5. Technology enhancing out-put of the finance sector, 6. Change in cultural norms of high-wage pay-out, and 7. Changes in taxation scheme. Reviewing these perspectives, it can be found that there are several aspects which have already been discussed earlier, such as education and labour productivity in chapter 1 "Inequality's influences – Are differences bad?". To maintain an overview of different effects, the various aspects will be distinguished between those causing 'The spurring top income' and those causing 'The lagging bottom income'.

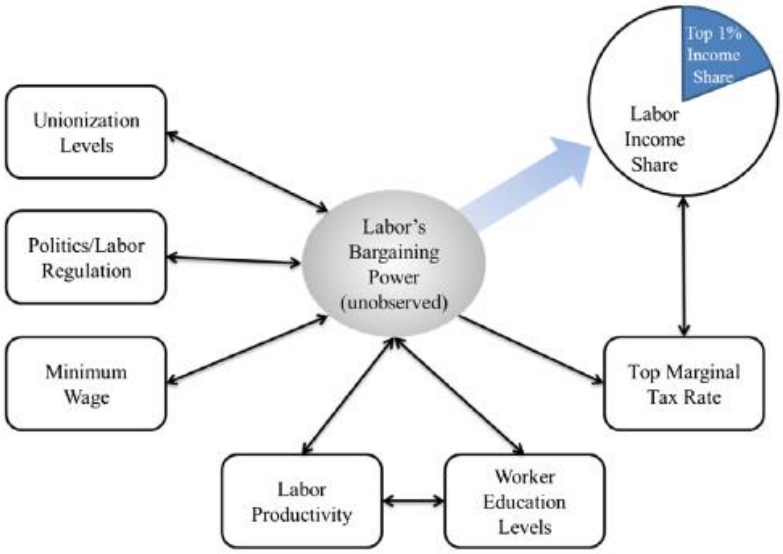


**Figure 50 The interplay of various parameters in relation to labour's bargaining power.** *Note: This figure has been obtained from* **(Malloy, 2020)**.

### *The spurring top income*

Top incomes have risen considerably in the past decades and have certainly aided in the increase in income inequality (Atkinson, Piketty, & Saez, 2011). According to Bivens & Mishel (2013), about 60% of the cumulative growth gap between the middle quintile and the average income growth rate between 1979-2007 can be solely contributed to the top 1%. This difference in growth rate has caused, for example, that the top 1% of the income distribution increased from a 9% share of the total income in 1976 to 20% in 2011, an 11-percentage point increase. This is almost four times as large as an increase compared to the growth of the 95$^{th}$ to 99$^{th}$ percentiles in the same period, i.e., an increase of 3% in total share of the income (Alvaredo, Atkinson, Piketty, & Saez, 2013). As explained by Alvaredo et al. (2013), there have been various effects that caused an increase in top income, i.e., tax policy, labour market changes, capital income, and correlation between labour income and capital income. In this, the growth seemingly is equally distributed over an increase in income from capital and labour, as can be seen in Figure 51.

In the previous parts of this thesis, capital income has already been discussed and the correlation between capital and income has been explained. What is yet to be discussed are the changes that benefitted the incomes, i.e., superstar theorem and tax changes. Moreover, it will be shown that part that the spurring top income and lagging bottom income are interacting with each other. Therefore, it should be highlighted that while the top and bottom income changes are being discussed separately, they should be viewed as two faces of the same coin. However, as it is impossible to look at the front and back of a coin at the same time, the processes will be discussed separately for convenience's sake.

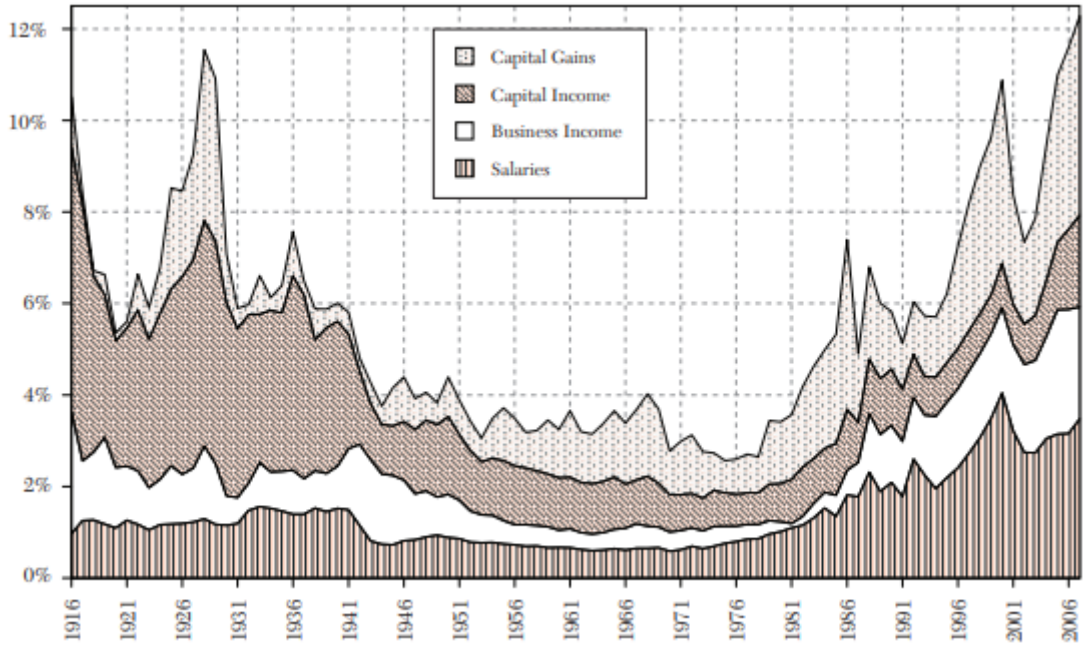


**Figure 51: Composition of income and income share of the top 0,1%.** *Note: Income is defined as market income, i.e., before tax and benefit transfers. Salaries indicate wages, salaries, bonuses, exercised stock options, and pensions. Business income indicates profits from sole proprietorships, partnerships, and S-corporations. Capital income indicates interest, dividends, rents, royalties, and fiduciary income. Capital gains indicates realized capital gains net of losses. Results are based upon the article's author's calculation using a database of Piketty and Saez* **(2003)** *which has been updated to 2007. This figure has been obtained from* **(Atkinson, Piketty, & Saez, 2011)**.

### Superstar theorem

An important part of the escalating top incomes has been contributed to the superstar theorem which has been theorized by Rosen (1981). He explained that at the far extremes of talent a small increment in talent causes a more extreme difference in wage. For example, the best surgeon in the world will only have a small increase in the success rate of operation but will have a much larger increase in wage because of being the very best by which he attracts a much larger demand. In essence, the demand for top-quality causes that at the far ends of various fields the increase in incomes extends above the increment of talent.

This notion has also been found by Gabaix & Landier (2008). They found that the marginal increase in the talent of the managers caused a dramatic wage increase. For example, the CEO of the number one company could increase market capitalization by 0.016% compared to the CEO of the company at the 250$^{th}$ position but had a 530% higher wage. According to Bakija et al. (2012), the effect of the superstar theorem is enhanced by globalization and technology, i.e., there are larger opportunities to sell one's product over a large consumer base. As such, the national superstars can now compete internationally causing an increase in demand for the top talents which further increases their income.

The increasing income gap is also strongly exemplified by the ratio of CEO-wage compared to the average income of the company. In the early 1960s, the ratio of CEO-to-worker payments was 21.1. However, after the 1990s a large increase in the ratio occurred and rose to 351.1 (Mishel & Kanda, 2021), as shown in Figure 52. Mishel & Kanda (2021) state that the exorbitant pay-out to CEOs is a major contributor to the inequality. Partly, this has been enabled due to their high bargaining power by which they can set their pay-outs. According to their report, the economy would incur no consequences when their pay-

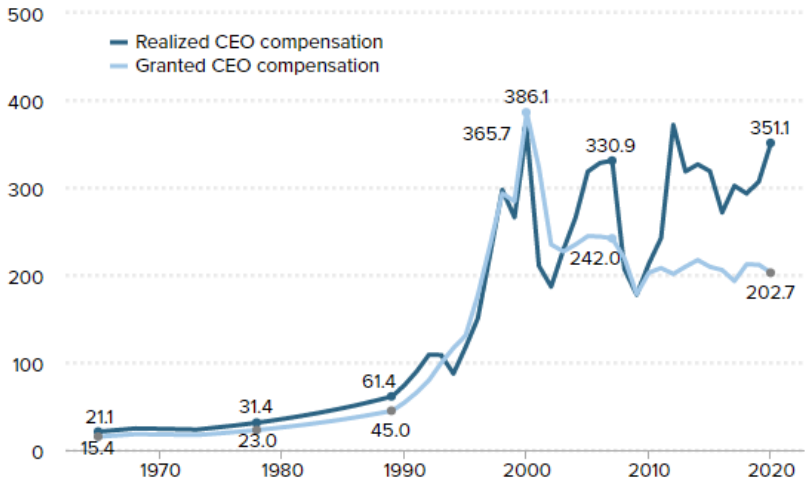


**Figure 52 CEO-to-worker compensation ratio between 1965-2020.** *Note: The compensation of the CEOs has been calculated by averaging the top 350 U.S. firms (ranked by sales). The granted compensation is composed of salary, nous, and incentive pay-outs and the value of the stock options and awards when granted. This is opposed to realized, which projects the value by including stock options exercised and vested stock awards. Typical work compensation is composed of an annual salary plus benefits for a full-time worker in a production/nonsupervisory position. Data has been obtained from the Compustat's ExecuComp database from the Bureau of Labor Statistics' Current Employment Statistics data series combined with the Bureau of Economic Analysis NIPA tables. This figure has been obtained from* **(Mishel & Kanda, 2021)**

out would be reduced. Policies which could limit their pay-out would include increasing the shareholders' influence on CEOs' pay-out, legislative limitations for companies, and increasing the top marginal tax.

In a more thorough analysis of why executive pay grew, Bebchuk & Grinstein (2005) found that the increase can largely be contributed to the combination of increased bargaining power and financialization which gave new opportunities to accrue increased incomes. The idea is that industries had changed the wage structure, using bonuses and stock options which inflated the wages for top incomes but also changed the attention of the sectors. Tomaskovic-Devey & Lin (2011) state that wages increased to be 60% higher than other industries' income and coincide with an income transfer of 5.8-6.6 trillion dollars. There is a trend of industries diverting investments from production towards the finance sector to increase their short-run profits, in part, due to correlations with favourable managerial pay-outs (Turner, 2017).

### Tax changes

Another important factor in the increasing income divergence has been the changing tax policies that enabled higher (real) top incomes. Piketty (2014) showed that marginal taxes for the highest tier have been decreasing in the second period of the 20th century, exemplified by Figure 53. In response to this decrease in top marginal income, the income share of the top has doubled (Alvaredo, Atkinson, Piketty, & Saez, 2013). Piketty et al. (2014) state that reduced taxation enabled this increase due to having higher efficiency for CEO's/managers to bargain for higher wages as its effective result on wage increase was much higher. This seems to be further exemplified by the negative correlation between CEO pay-out and the top marginal tax rate (Piketty, Saez, & Stantcheva, 2014), as shown in Figure 54.

Interestingly, the top marginal tax mainly impacts the income of the very rich, i.e., the top 1% of the income distribution, while the income of the following 9% hardly adjusts their income to changes in the top marginal tax rate (Saez, Slemrod, & Giertz, 2012). However, the higher sensitivity of the top income possibly is potentially mainly caused by

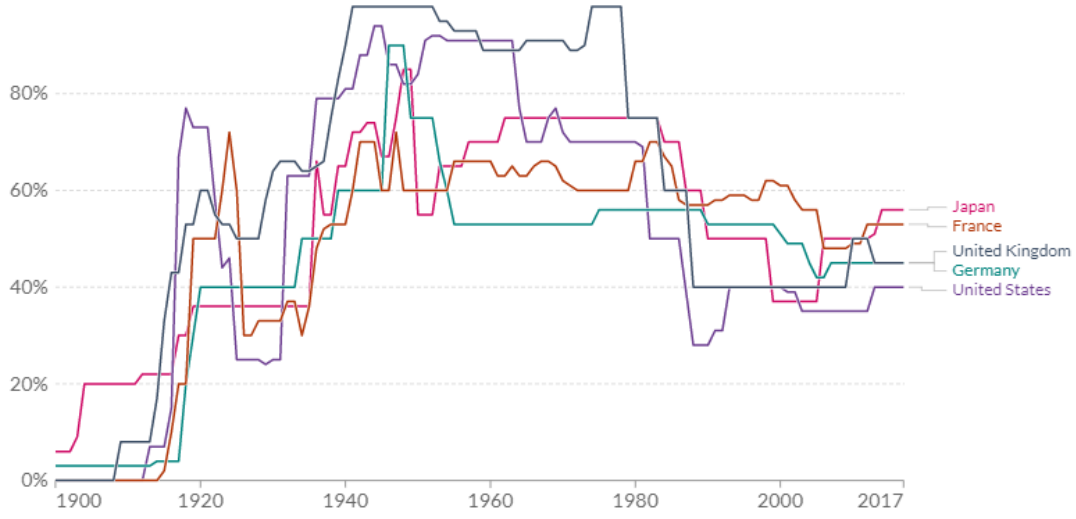


**Figure 53 The progression of top marginal income** *Note: This data has been retrieved from the World Inequality Report in 2018 and represents the period 1900-2017. This figure has been obtained from* **(Ortiz-Ospina & Roser, 2016)**.

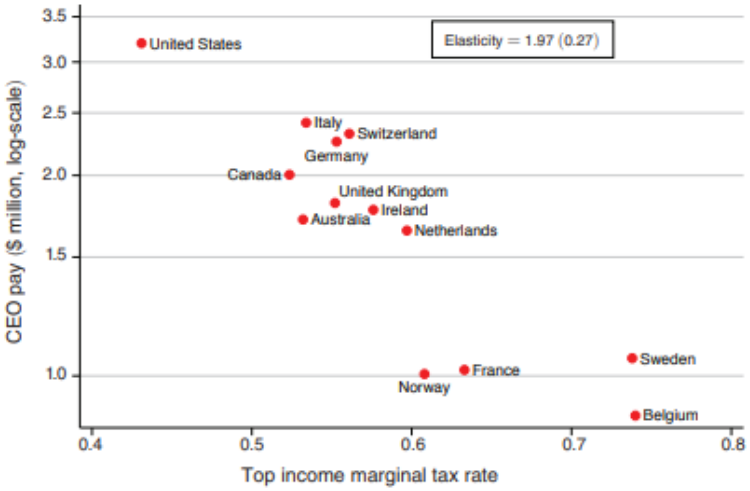


**Figure 54 Correlation between CEO pay-out top marginal income tax rate.** *Note: This figure has been obtained from* **(Piketty, Saez, & Stantcheva, 2014)**.

adjustments in taxable income (not in true income) because of attempts to reduce tax payments through tax avoidance & evasion. Thus, it can be questionable whether taxes change registered or true income. Nonetheless, Bivens & Mishel (2013) state that an increase in top marginal income can be effective to curb income inequality and does not damage overall economic growth. This would an important notion as it would give potential to attempt to decrease top income with taxes without any side effects on economic growth.

Bivens & Mishel (2013) state that using the top marginal tax rate as a tool to control top income is one of the most efficient strategies. While it would also be possible to control the source of the problem, i.e., the mechanisms through which the top income are able to increase their income, this seems inefficient as there are many avenues through which they can do so. For example, increased income is related to inflated income due to top-income decisions by wage holders instead of stakeholders, exploitation of information asymmetries, reduced bargaining power of other employees, non-cash payment favourability, and performance-based pay-outs (Bivens & Mishel, 2013). As such, attempting to tackle the source of the income will require a larger number of policies while a single policy, i.e., tax change, will be able to affect the outcome.

### *The lagging bottom income*

In the previous portion, it has been explained why the top earners have seen their income growing considerable, but it does not explain why the bottom incomes are lagging. When reviewing the literature, it can be found that this has been connected to the retrenchment of the welfare state, as mentioned earlier. A key notion to the cause of the retrenchment is the correlation between the labour market and the social security provided. It would be too extensive to discuss these two notions in full depth, however, two aspects are mentioned more frequently when reviewing parameters related to the lagging bottom income: 1. Faltering trade unions and 2. Falling minimum wages.

#### Faltering trade unions

An important parameter for diverging incomes is the presence of trade unions. They perform wage bargaining between employers and a collective of employees to gain bargaining power. The idea is that trade unions can claim higher wages as their

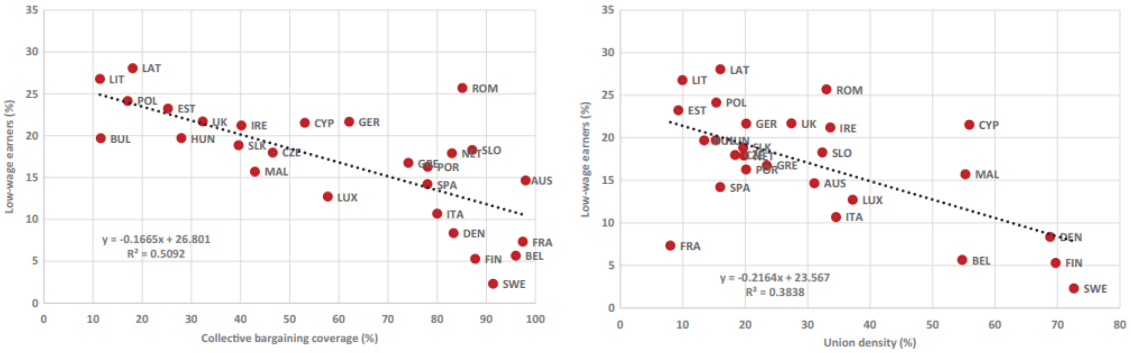


**Figure 55 Effects of, left) collective bargaining coverage and, right) trade union density, on low-wage earners.** *Note: Both panels represent average results for the EU-27 for the period between 2000-2016. Low-wage workers have been formulated as having income below 2/3rd of the mean income in the period 2006-2014. Calculations are based upon data from Eurostat and OECD. This figure has been obtained from* **(Keune, 2021)**.

bargaining power is increased by the support of a large employee force, in contrast to employees who bargain on their own. This seems to be an effective tool as there are clear negative correlations between the number of low-wage earners and high collective bargaining coverage and high trade union density (Keune, 2021), as shown in Figure 55.

According to Kristal & Cohen (2017), de-unionization could potentially explain up to 50% of the growing inequality, as shown in Figure 56. They state that this impact is (partly) caused by the fact that trade unions are also impacting the wage of non-members within that industry. Their theory is that markets with trade union presence cannot (heavily) underpay non-members as it can incentivize them to unify with the existing trade unions. Moreover, they find that trade unions also limit top income, as shown in Figure 57, and create fewer managerial positions. Overall, the consequences of trade unions do not only impact low-income but also top-income, by which they are seemingly effective in reducing income inequality.

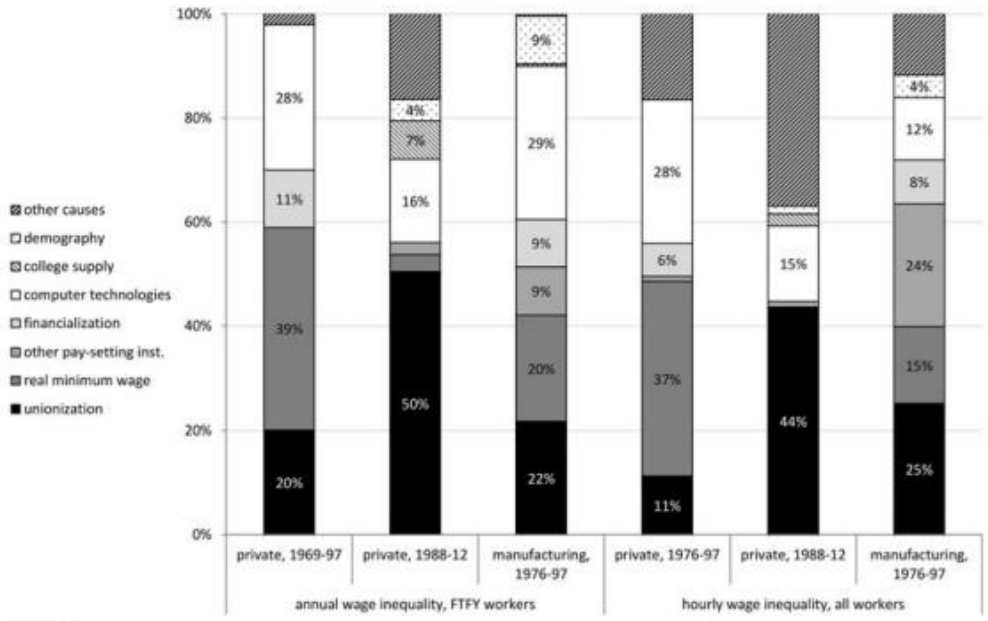


**Figure 56 Decomposition of variables impacting income inequality in the United States.** *Note: Results are based upon the article's author's calculation using data from Standard Industrial Classification and North American Industry Classification System for the period between 1969-2012. This figure has been obtained from* **(Kristal & Cohen, The causes of rising wage inequality: the race between institutions and technology, 2017)**.

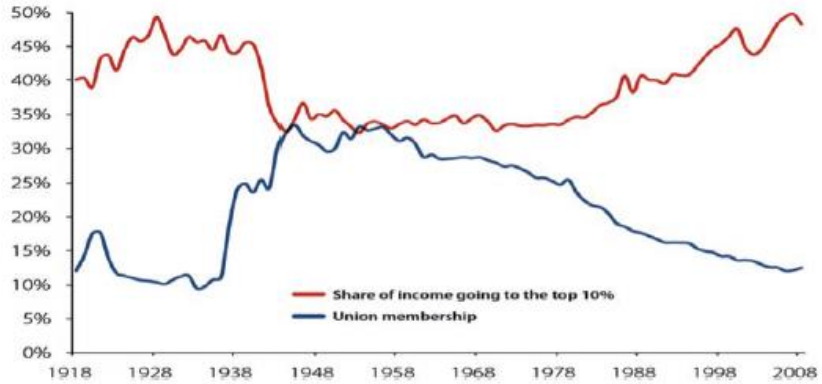


**Figure 57 Correlation between income share of the top 10% and union membership.** *Note: Results based upon the author's analysis reflect data concerning the U.S. from 1918 to 2009. Data from the Historical Statistic of the United States, The World Top Income Database, and Piketty and Saez* **(2003)**. *This figure has been obtained from* **(Gordon, 2012)**.

Problematic to the effectiveness of trade unions is their dependence on governmental policies. For example, governments can implement the extension of collective agreements by which non-unionized labourers are also benefitting from the agreements made (Keune, 2021). However, governments and institutes have been undermining rather than promoting these features (Van Gyes & Schulten, 2015). As an example, to gain financial support after the crisis, Portugal, Ireland, Spain, and Greece had to put through extensive reforms which included lowering of minimum wage, decentralization of collective bargaining, and reductions in coverage of collective bargaining which have been directly hindering the reduction of income inequality. It would be beyond this thesis to summarize the whole research performed by the European Trade Union Institute regarding wage bargaining, as such I would like to refer to their report (Van Gyes & Schulten, 2015). However, there is a noticeable difference between nations and income inequality which can be related to the strength/protectiveness of the labour market, with stronger labour markets showing lower inequalities (Tridico, 2018), shown in Figure 58.

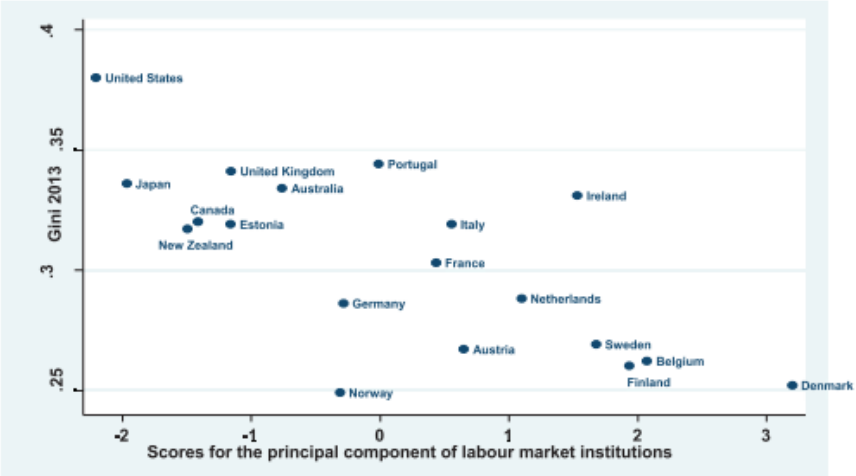


**Figure 58 Correlation between income inequality and liberal labour markets.** *Note: The x-axis represents an indicator value of 10 different labour market institutions, with higher values being less liberal. The results are based upon the article's author's calculations using data from the OECD. This figure has been obtained from* **(Tridico, 2018)**.

## Falling minimum wage

An important institutional policy is the minimum wage setting as it creates a (financial) statement in regard to the minimum amount of income required to support basic living conditions. As such, companies are obliged to at least provide this minimum wage which creates a lower boundary to income and should prevent workers from falling into poverty. However, minimum wages are not necessarily automatically adjusted to changing economic conditions. For example, according to Autor et al. (2016), there has only been a limited increase in real minimum wage between 1979-2012 which has been contributing to the income inequality within the USA.

While at first inspection, the minimum wage affects only the lowest wages, its influence is far greater than that. It has been shown by Malloy (2020) that an increase in the minimum wage has a significant effect on top managerial income. The reasoning behind this effect is that to retain the profitability of a company an increase in lower wages needs to coincide with a decrease in top income wages. Moreover, Cengiz (2019) found that the minimum wage affected wages up to $3 above the threshold. When increasing the minimum wage several effects are occurring, as summarized in Figure 59.

These exist out of 1. Missing jobs, some jobs will be removed due to excessive costs for the company, 2. Bunching, the jobs that had wages in the region between the new and old minimum income will pay the new minimum wage causing an increase in the number of jobs to pay minimum income 3. Non-compliance, there will be jobs paying wages beneath the minimum wage not complying with the new wage setting, 4. Spill-over, jobs which formerly paid just above minimum wage want to keep paying above minimum wage income and thus increasing the wage to avoid minimum wage payment.

An important side effect of minimum wage increases is the effect on the labour market. Frequently it is hypothesized that an increase would cause a decrease in labour demand as it would not be cost-effective. This interaction between increasing wages and

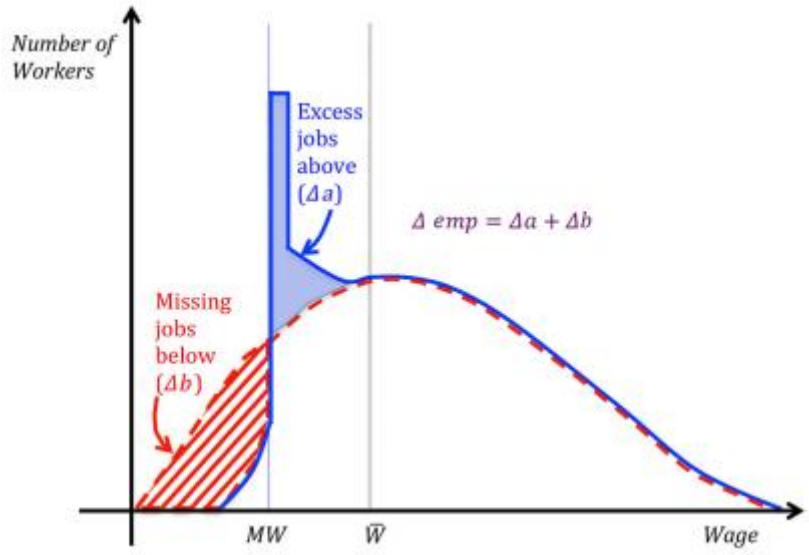


**Figure 59 Effect of increasing minimum wage showing bunching, spill-over, and job loss effect.** *Note: Red line indicates wage distribution before the minimum wage increase. The blue line indicates wage distribution after the minimum wage increase. The change in employment (Δ emp) equals the number of excess jobs (Δ a) minus the number of missing jobs (Δ b). MW indicates the minimum wage. W indicates the wage cut-off until which the employment is altered due to the minimum wage increase. This figure has been obtained from* **(Cengiz, Dube, Lindner, & Zipperer, 2019)**.

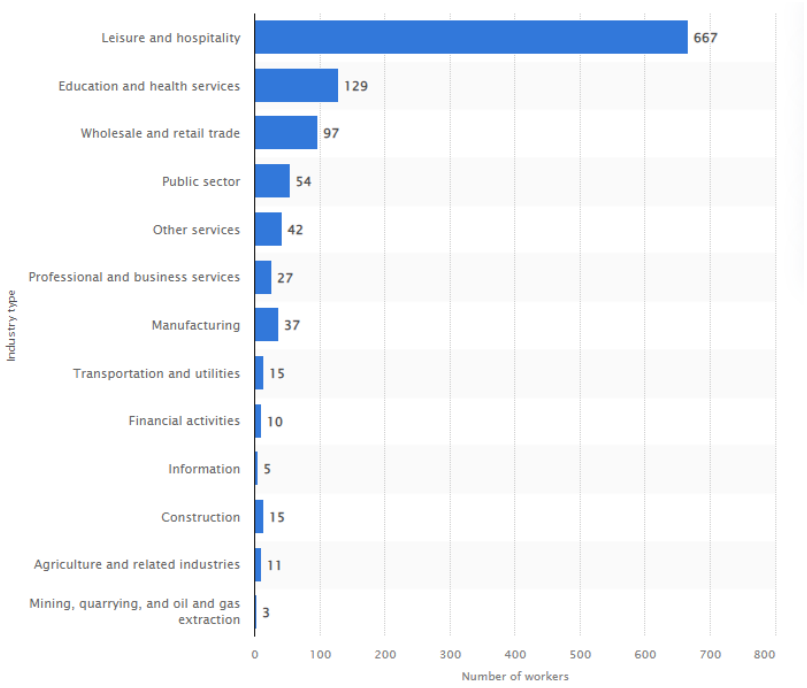


Figure 60 Number of employees paid minimum wage differentiated per industry. *Note: Results reflect workers who are 16 years or older within the US in 2020. Data is retrieved from the Bureau of Labor Statistics. The figure has been obtained from* (Statista, 2022).

the lay-off of employees is captured by the parameter elasticity of substitution. This elasticity of substitution differs per industry as it is not as easy for different types of industries to remove human labour in favour of capital intensified methods. For example, Cengiz et al. (2019) show that in the manufacturing industry the elasticity of substitution is 1.4. Thus, an increase in wages will cause a shift from human labour to capital having a negative influence on income inequality. This is in stark contrast to the service industry, such as waiters, which experienced an elasticity of substitution close to 0 (Cengiz, Dube, Lindner, & Zipperer, 2019). As such, the service industry responds barely to wage increases as an input to transforming human labour into capital. Therefore, in the service industry there seem to be significant opportunities to decrease wage inequality by raising minimum wages. When reviewing the statistics of the Bureau of Labour Statistics from the US (Statista, 2022) it can be found that Leisure and hospitality industry, i.e., the service industry, constitutes almost 60% of all employees being paid the minimum wage, as shown in Figure 60. Thus, while an increase in wages could cause job loss, the largest industry which is being affected has a close to zero elasticity of substitution. Seemingly, there could be gains achieved in increasing the minimum wage to combat income inequality.

## 3.2 Wealth Inequality

Wealth inequality has gained immense attention after the publication of Piketty (2014). In this book, he discussed wealth inequality at large and showed the potential of wealth to shape economies. There are significant reasons to discuss wealth inequality. For example, the Gini index for wealth inequality is much larger than that for income inequality, i.e., 0.5-0.9 compared to 0.3-0.4 respectively in developed countries. This gets put into perspective more aptly when the size of wealth owned is set against the population size, as shown in Figure 61. Wealth inequality is seemingly becoming more problematic due to its overwhelming size and its tremendous growth which is exemplified by the following notes of the Oxfam report in 2018 (Oxfam international, 2018):

- In 2017 82% of the growth in wealth went to 1% of the world population and about half of the population had no change in wealth at all.
- The richest 1% of the globe owns more than the following 99%
- In the period from 2006 to 2015 the common worker saw an increase of 2% per year in income while billionaires saw an increase of 13% a year
- The number of people who own as much as the bottom 3.7 billion decreased from 62 to 41
- Keeping income distribution constant, the global economy needs to increase by a factor of 175 to push everyone above a 5-dollar income (an ecological impossibility).

According to Davies & Shorrocks (1999), the accumulation of wealth can only occur via two processes, i.e., through income saving or inheritance. The importance of wealth transfers and income is also supported by Semyonov & Lewin-Epstein (2013). Their analysis shows that wealth accumulation occurs through income from labour and wealth transfers, which remains consistent even when adjusting for differences in economy, taxation, and benefit programs between different countries. However, there are other parameters which also contribute to wealth inequality (also shown in Figure 62) (Leitner, 2016): 1) Age 2) Education 3) Inheritance 4) Household composition 5) Income. From this analysis, yet again inheritance, i.e., wealth transfers, are the most important factor for the analysed countries. Having discussed income inequality and education earlier, and stating that age and household are more demographic factors that are outside the scope of this thesis, I will only review wealth transfers.


**Figure 61 Distribution of wealth owned by wealth brackets and its share of the total wealth.** *Note: Data has been obtained from Credit Suisse Global Wealth Databook in 2020. This figure has been obtained from* **(Inequality.org, sd)**.

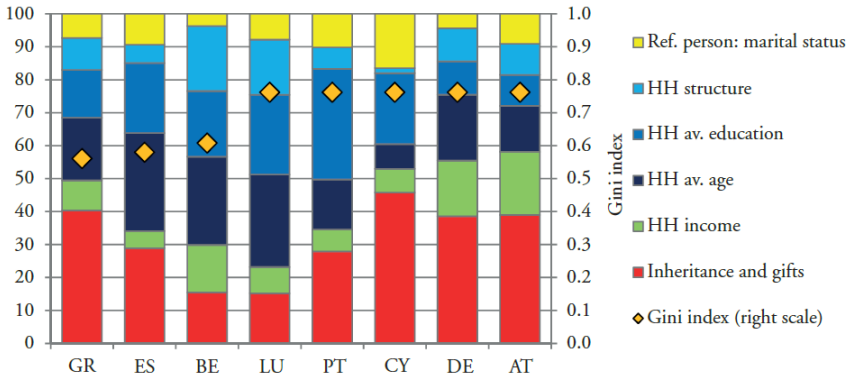


**Figure 62 Decomposition of the origins of net wealth for 8 different EU countries.** *Note: The results are based on the article's author's calculations, using the database of the HFCS in 2010. The author made use of Shapley value decomposition for net wealth. HH=household, GR=Greece, ES=Spain, BE=Belgium, LU=Luxembourg, PT=Portugal, CY=Cyprus, DE=Germany, AT=Austria. This figure has been obtained from* **(Leitner, 2016)**.

However, it is important to stress that wealth accumulation has its particular use in society as explained by the Life-Cycle theory. This theory states that wealth smoothens expenditure in various stages of life when income is not supporting expenditure sufficiently (Modigliani & Brumberg, 1954), as shown in Figure 63. A natural consequence of the theory would be that wealth is unevenly distributed because people are in different stages of life of the life cycle (explaining the effect of age on the wealth inequality). Moreover, as the life cycle is dependent on income and consumption, the size will differ between people even if they are at the same stage in the life cycle. However, the life cycle theory is being debated as it assumes careful planning of finance and reviews the life cycle of a specific person (thus negating potential wealth transfers). While these issues are to be considered, Deaton (2005) explains that the general concept of the life cycle remains to be largely true nonetheless for most people.

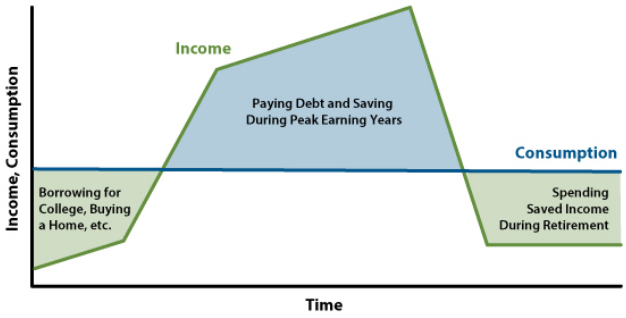


**Figure 63 General theory behind the life cycle theorem.** *Note: The blue line indicates an average consumption whereas the green line indicates income. In the green areas, wealth is being invested while in the blue area wealth is being accumulated. This figure has been obtained from* **(Wolla & Sullivan, 2017)**.

## Wealth transfer

Wealth transfer is the process of transferring wealth from one entity to another. Up till now, it has mostly been referred to as inheritance, but wealth transfers can actually occur via two routes, i.e., inheritance and in vivo transfers (Piketty, 2014). The distinction between the two is of importance as in vivo transfers are performed before

death and require an active procedure, having a pre-emptive plan, while inheritance transfers are performed after death and occur automatically without the necessity of a pre-emptive plan.

This distinction is highlighted by Wolff & Gittleman (2014), showing that wealth transfers through inheritance occur unplanned for most people. The inheritance had been accumulated from a life-cycle perspective to adjust for potential expenses occurring such as health shocks and emergencies expenditure and only secondary, if not consumed, is perceived as an investment to be transferred to offspring. It is only the very top of the wealth distribution who accumulates wealth with the main purpose for it to be transferred to offspring (Wolff & Gittleman, 2014). This is in clear contrast to in vivo gifts, i.e., gifts given during life, that are designed to pass on their socioeconomic status to offspring (Albertini & Radl, 2012). However, the size of the required in vivo gifts differs as the costs of transferring socioeconomic status to the offspring differ for the working class as compared to the service class. This, for example, is caused by differences in required investments into human capital, i.e., requiring tertiary education by the service class in contrast to limited education requirements by the working class. However, Albertini & Radl (2012) do acknowledge the existence of altruism and reciprocity for in vivo gifts, but state that the perspective of socioeconomic reproduction is more befitting according to their research. This has been aptly narrated by Semyonov & Lewin-Epstein (2013):

> *"These findings shed light on social and economic inequality as a temporal process whereby inequality develops within one's lifetime but is transmitted across generations."* - Semyonov & Lewin-Epstein (2013)

Interestingly, there seems to be a shift from inheritance transfers toward in vivo wealth transfers in the past decades, as shown in Figure 64. As Piketty (2014) shows, a century ago in vivo transfers contributed around 15% of the wealth obtained while in present times it rose to almost 50% of the wealth. He reasons that this is caused by the increasing life expectancy of the population. The parents attempt to transfer wealth to the offspring at a time of need. While a century ago the inheritance would be obtained

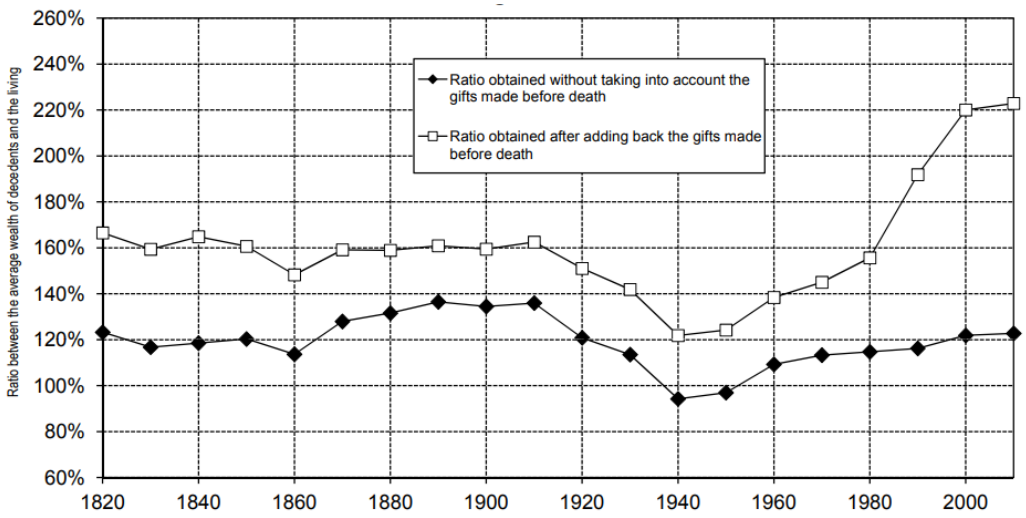


**Figure 64 Amount of wealth transferred with and without in vivo transfer.** *Note: Y-axis indicates the wealth ratio between the average wealth of the decedents and the living. The triangle line indicates wealth transfers via inheritance. The squared line indicates wealth transfers via inheritance + in vivo. Data is shown for France in the period 1820-2010. This figure has been obtained from* (Piketty, 2014).

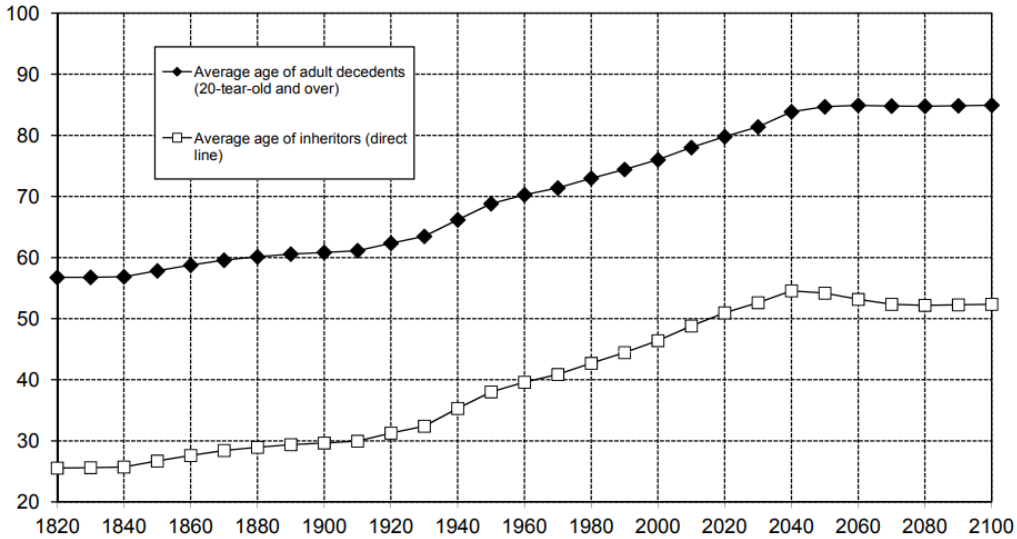


**Figure 65 Age of death of descendent and inheritance receiver.** *Note: Rectangle line indicates average life expectancy for people >20 years old. The squared line indicates the age of receiving an inheritance from the decedent. Data is shown for France in the period 1820-2010. This figure has been obtained from* **(Piketty, 2014)**.

around the 30th life year, in recent times this would be around the 50th life year, as shown in Figure 65. As such, inheritance is now received "too late" to bring aid to the offspring in times of need and does not aid in promoting the socioeconomic position. To compensate for the tardiness of inheritance transfers, parents are transferring wealth in vivo. When reviewing at which age wealth is being transferred to the children in present times, this is roughly around 10-15 years before the time of death causing that the offspring still receive their wealth during the (late) thirties (Piketty, 2014).

While Piketty (2014) has made important remarks concerning wealth transfers and their effects on inequality, he certainly does not stand alone in this assessment. For example, Adermon et al. (2018) reviewed the occurrence of wealth transfers in Sweden and found that the impact of inheritance on owned wealth is reaching 50% correlation and effects for wealth are even apparent between grandparents-grandchildren. The effects have also been noted by the OECD (2021) which finds that the high impact of inheritance had been dwindling between 1900-1975, but it has been rising again after 1975 where Sweden was the country with the lowest inheritance effect (45%) and the USA had the highest impact (60%), as shown in Figure 66. In the end, the OECD (2021) concludes that with the current development of wealth, inheritance will play a pivotal role in wealth accumulation from which primarily the wealthy will benefit and gain advantages in the economic market.

However, somewhat counterintuitively, inheritance actually does cause a decrease in relative inequality and only increases absolute inequality (Boserup, Kopczuk, & Kreiner, 2016). Elinder et al. (2018) explained that this equalizing effect is primarily the consequence of the fact that debts cannot be inherited. As such, not receiving wealth by the lower deciles is still having an equalizing effect because their parents own negative amounts of wealth. Moreover, because the lower decile groups own only small amounts of wealth, even a small inheritance is of considerable size to them (Elinder, Erixson, & Waldenstörm, 2018), as shown in Figure 67. However, the decrease in relative wealth inequality is stated by its short-term effect, i.e., affects up to 3 years after the transfer

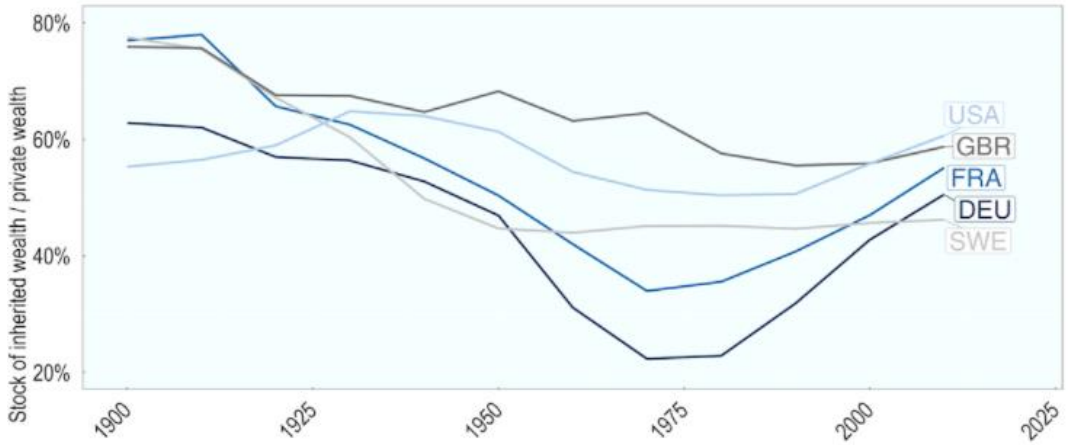


**Figure 66 Contribution of inheritance to wealth.** *Note: Data has been obtained from Alvaredo et al.* **(2017)** *and Ohlsson et al.* **(2020)** *for Sweden specifically. Data representing the United States are unweighted averages of benchmark and high-gift estimates. Data runs from 1900-to 2010. This figure has been obtained from* **(OECD, 2021)**.

(Elinder, Erixson, & Waldenstörm, 2018). The short-term reviews neglect potential revenue obtained from future investment. This becomes more important due to decreasing propensity to consume wealth along with increasing wealth/income deciles, as discussed earlier in the section 1.4 Economy under Consumption. According to their research, it is likely that the relative reduction of relative inequality is a short-lived effect after inheritance. I have not encountered research showing the long-term effect of inheritance, but my hypothesis would state that the effects are only short-lived due to consumption differences and investment opportunities.

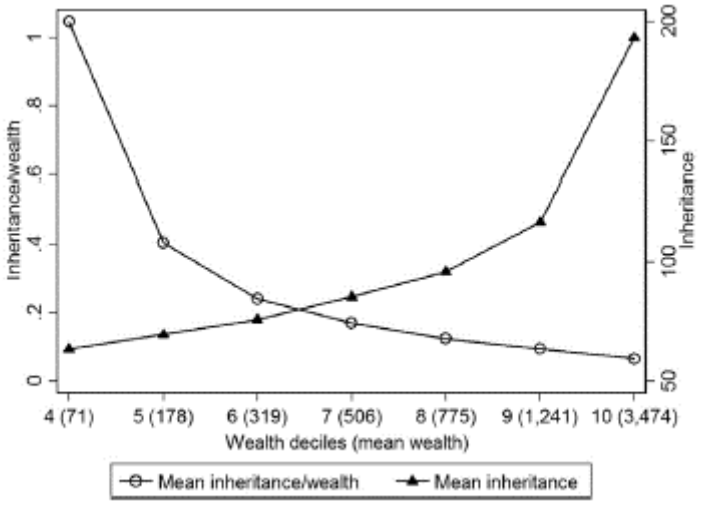


**Figure 67 Relative and absolute amount of wealth earned per decile.** *Note: The triangle line represents the average absolute inheritance received (in Swedish Krones), with a scale bar on the right. The circle line represents the average relative inheritance received, with a scale bar on the left. The three lowest deciles are excluded from graphical representation as they own a negative amount of wealth making the relative amount of wealth received insensible. The data represents the population of Sweden in 2003 based upon a survey from the cohort 2002-2004. This figure has been obtained from* (Elinder, Erixson, & Waldenstörm, 2018).

While the OECD (2021) mentions that inheritances are of large importance, Boserup et al. (2018) show indications that in vivo transfers are potentially of larger importance. They reviewed in vivo transfers occurring at a young age, i.e., before the age of 18, and found that they had a significant impact on wealth later in life. These transfers at a young age were a stronger predictor of future wealth than wealth owned by parents. They show that this relation is not explained by education or capital accumulation, i.e., the wealth owned by an 18-year-old is too small to accrue such rent, but it is possibly explained by differences in financial behaviour, e.g., differentiation in the habit to save and invest (Boserup, Kopczuk, & Kreiner, 2018). If so, this would be an interesting thought as it could indicate a learned habit, which potentially can be educated.

Next to the previous discussion of inheritances and in vivo transfers, it should be highlighted that real estate holds a pivotal role in wealth inequality and wealth transfers (Semyonon & Lewin-Epstein, 2013; Christophers, 2018; Pfeffer & Waitkus, 2021). This perspective is supported by the enormous wealth sizes involved in real estate, i.e., 80% of the population has >50% of its wealth entrenched in real estate (Azpitarte, 2010). Christophers (2018) explains that the housing market is entrenched in youngsters not being able to afford new housing and the elderly who are owning real estate. This can also be noted by the steadily decreasing number of house owners in the category 24-35 years over the past decades (Fuller, Johston, & Regan, 2020). The relation between real estate and wealth (inequality) seems to be troubling as young people seem to be locked out of the housing market and need to rent real estate causing an inverse transfer of wealth from young to old (Christophers, 2018), that is becoming increasingly problematic with increasing real estate values (Fuller, Johston, & Regan, 2020).

According to both Fuller et al. (2020) and Christophers (2018), the gap between house owners and non-house owners is being aggravated through wealth transfers. The coming decades will be pivotal as the baby boomer generation will start to transfer large volumes of (real estate) wealth to their offspring (Christophers, 2018). This could potentially lead to political conflicts between young-old and non-housing/housing owners (Fuller, Johston, & Regan, 2020). I will avoid performing an in-depth analysis of the real estate market but would like to end with the statement that real estate is an important mediator in wealth inequality and fully deserves attention with respect to economic inequality.

## 3.3 Opportunity inequality

In the previous sections, the occurrence of income and wealth inequality has been described. In this section, attention is given to opportunity inequality which is of importance to changes within the (socio-)economic ladder. The large importance of this occurrence is mentioned by Alan Krueger (2012) in the following statement while being the Chief Economist of the US Department of Treasury:

> *"Higher income inequality would be less of a concern if low-income earners became high-income earners at some point in their career, or if children of low-income parents had a good chance of climbing up the income scales when they grow up. In other words, if we had a high degree of income mobility we would be less concerned about the degree of inequality in any given year"* – A.B. Krueger (2012)

In essence, Krueger states that income and wealth inequality can be accepted if all individuals are moving up and down the ladder and can experience favourable conditions during some period of their lifetime. This notion of acceptable inequality has also been found by Starmans et al. (2017), showing that inequality is not necessarily an unwanted feature, it is the unfairness that is being condemned. Therefore, they state that policies should focus on creating equal opportunities instead of (more) equal outcomes.

If opportunity equality is the ulterior goal, then the concept of origin independence, i.e., the income of the parents has zero correlation to the income of the child, will be the holy grail. This concept revolves around the idea that the child obtains his income based upon his own merits and everyone has the same "playing field" in regard to opportunity. However, Roemer et al. (2004) describe that it will never be possible to create independence of origin because the family influences: 1. The aspiration and goals of the offspring, 2. Genetic transmission of abilities, 3. Social connections of the family, and 4. Family culture and investment. As these aspects are largely considering the private space of families, it will be impossible to create equality (in social background) because governments are not to interfere with the private space of social structures (2015). Moreover, because income and wealth inequality have a bidirectional interaction with opportunity inequality, i.e., it can influence political power and educational opportunities which grants the opportunity to further strengthen income and wealth inequality (Corak, 2016), it is impossible to create complete opportunity equality as income and inequality will always exist.

It is also important to note that equality of opportunity does not necessarily have to lead to economic mobility (the ability to move along the socioeconomic ladder). For example, assortative mating, i.e., people with similar backgrounds creating new families, is a limiting process to economic mobility as (genetic) advantages are being transferred to the offspring. As such, highly educated parents receive offspring with larger potential than low-educated parents receive offspring with limited educational prospects (Arneson, 2015). Thus, while one can attempt to create equal opportunity (e.g. equal schooling equality) it can still be that the ability to move across the socioeconomic ladder is limited. In the end, the socioeconomic ladder is shaped by the characteristics of the individuals climbing it, while it can certainly be that moving up and down is difficult (low mobility), the perceived goal should be fairness causing that everyone has equal chances (opportunity equality).

### Economic mobility

Economic mobility is an umbrella term for quantifying the ability to alter income or wealth relative to a certain perspective and can be perceived to be a representative of opportunity. Broadly, four different perspectives can be distinguished (Sawhill & Morton, 2007):

1. Inter-generational mobility: The change of income compared to another generation, mostly viewed from a father-son perspective.
2. Intra-generational mobility: The change of income compared to peers within the generation, often a career perspective is taken.
3. Absolute mobility: The change of income in absolute figures compared to another point in time. This can also be called structural mobility, it does not per se alter

the ranking of the distribution, but it can change the shape of the distribution of income.

4. Relative mobility: The change of income in respective to another, thus the change upon the economic ladder. This can also be termed exchange mobility, the relative rise of one person causes the relative decrease of another person.

The first two types of mobility describe the mobility compared to a specific group, while the latter two perspectives describe mobility compared to the shape of the distribution. As the interest of this thesis resides in reviewing economic inequality, it will mainly consider (re)shaping the distribution and, therefore, the last two perspectives will have larger significance, i.e., relative and absolute mobility. Their (unique) position in the field of inequality can be explained by the following two scenarios.

In the first scenario it is assumed that only absolute (income) mobility is present, thus an absence of relative (income) mobility. In such a case it would only be possible to change income, i.e., having a higher or lower income than before, but it would not be possible to earn more (less) than the person above (below) you within the distribution of income, as relative (income) mobility is not present. In this world, one can change one's income, e.g., lift oneself out of poverty, but one's position in the distribution is fixed in perpetuity. As such, the poorest people would continue to be the poorest people indefinitely. Such a system would be at risk of creating social classes as an initial economic position could lead to a fixed socioeconomic position.

In the second scenario it is assumed that only relative (income) mobility is present, thus an absence of absolute (income) mobility. In such a system there is no change in income for anyone, i.e., the shape of the distribution is fixed, but everyone would be able to swap positions with someone else in the distribution. Thus, the poorest person could become the richest person, but another person would need to take his place as the poorest person. In this world, there is fluidity in economic position and the ability to form socioeconomic classes is lowered. However, the number of people living in poverty is not altered, only the people affected by it would alter with the passing of generations.

The general takeaway from these scenarios is that absolute mobility is required to improve the living condition by pulling people out of poverty, i.e., changing the shape of the distribution, while relative mobility is required to obtain social fairness, i.e., avoiding fixation of (socioeconomic) position within in the distribution.

While mobility will be described as a separate entity within the field, it most certainly is interconnected to income and wealth inequality. This is shown by The Great Gatsby Curve in Figure 68 which indicates that there is a positive correlation between income inequality and income mobility (Krueger, 2012). It is difficult to give a (direct) causal explanation to this interaction, but Durlauf & Seshadri (2018) hypothesize that it can be explained by reduced mobility caused by increased segregation among classes. Class segregation in turn occurs through spatial segregation caused by spatial clustering of the rich (Reardon & Bischoff, 2011). This clustering is enhanced by increased income inequalities which gives high incomes access to (exclusive) expensive living locations. These locations are experiencing improved conditions, e.g., improved education as mentioned in section Education, and cause detachment of the rich from the other groups due to lowered interaction between classes. This in turn leads to a reduced incentive to support favourable policies for the other classes as unawareness and detachment dictate


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**Figure 68 The Great Gatsby Curve, the correlation between income inequality and income mobility.** *Note: Income inequality is measured by the Gini index using disposable household income. Intergenerational economic mobility is measured as the elasticity of average long-term income around the age of 30 between father and son. Data has been derived from the article's author's calculations and the OECD database. This figure has been obtained from* **(Corak, 2013)**.

(Reardon & Bischoff, 2011). As such, The Great Gatsby curve can be seen as a representation showing the complexity of the numerous cogwheels which are interacting in the system of economic inequality. However, it is difficult at best to prove how and why the interactions occur. To avoid going beyond the scope of this thesis, I will leave the analysis at this point and will explain the basic concepts of absolute and relative mobility.

### *Absolute mobility*

As mentioned, absolute mobility represents the change in income that alters the shape of the distribution curve. One can have negative (downward) and positive (upward) absolute mobility, with the former representing a decline in income while the latter representing growth (Berman, 2022). In general, one can relate absolute mobility with the state of the economy, i.e., a growing economy will cause positive absolute mobility when the growth is distributed equally along with the distribution (Manduca, et al., 2020; Kennedy & Siminski, 2021).

Chetty et al. (2017) reviewed absolute mobility over the course of time and found that absolute mobility declined in the United States in the 2nd part of the 20th century. This is shown by the fact that in the 1940s, 90% of the children earned more than their parents but this decreased to 50% of the children in the 1980s, as seen in Figure 69. Seemingly, this has been caused by the fact that the growth in GDP is concentrated among a smaller portion of the population when compared to the past. If the growth would be distributed among the population as it was in the 1940s, the absolute mobility would have been 80% instead of the measured 50% (Chetty, et al., 2017).

Besides the decrease in absolute mobility, there are also two other notions to be made when reviewing the evolution of the parent-children income curve between the cohorts of the 1940s and 1980s, shown in Figure 70. The first notion is that not only the chance for absolute mobility has decreased, but also the relative size of the increase in income has decreased. This can be concluded by noting that in the cohort of the 1940s, the 80th percentile of the parent's distribution corresponds with the 14th percentile of the

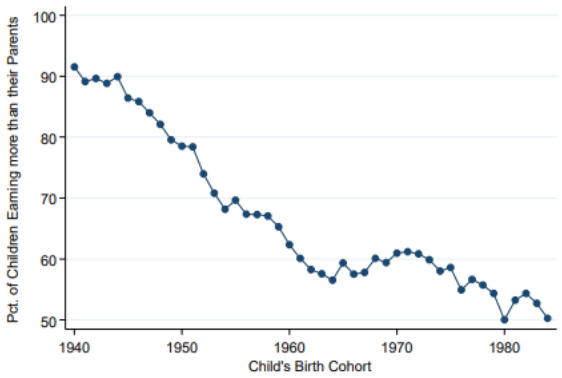


**Figure 69 Absolute mobility decreased from the 1940s up to the 1980s**. *Note: Percentage of children who were in a higher income percentile compared to their parent's income percentile. Parents' income is calculated as combined income with the highest income earner between the age of 25-35 using tax data between 1980-1982. The child's income is calculated using combined income from child and spouse income, at age of 30 from the CPS March supplement. Income is measured as real dollars in 2014 using CPI-U-RS. Parents with zero income were excluded. This figure has been obtained from* **(Chetty, et al., 2017)**.

children's curve while in the 1980s cohort this intersects with the 74th percentile. The second notion is that the peak of the income curve of the children (compared to the parents) is to the right in the 1940s cohort while it is on left in the 1980s cohort. Overall, the bunching of income thus occurs at a lower level with a longer tail to higher incomes. This is presumably a representation of the squeezing of the middle income, i.e., the income in the middle income is pushed towards low and high income, and a clustering in the low incomes.

However, the notion should be made that the decrease in absolute mobility is not a global phenomenon. For example, Manduca et al. (2020) extended the research of absolute mobility reviewing not only the United States but also including seven other Western countries, as shown in Figure 72. They found that Sweden, Finland, Norway, and Canada are having essentially stable mobility since the 1970s. However, a decrease is certainly also not unique to the U.S. alone, also Netherlands, Demark, and the UK experienced a decrease in mobility.

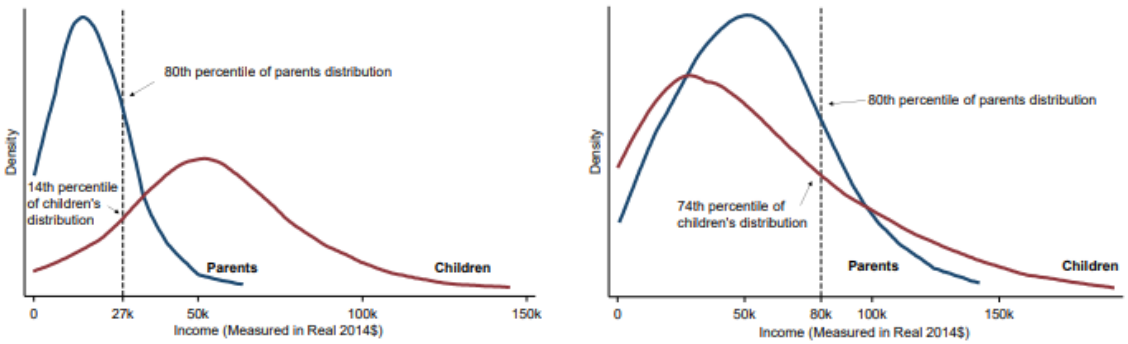


**Figure 70 Left panel) Family income distribution for birth cohort 1940, Right panel) Family income distribution for birth cohort 1980.** *Note: Blue line indicates parents' income, and the red line indicates children's income. Incomes have been scaled as real dollars in 2014. Incomes are measured around the age of 30. Parents with zero incomes have been excluded as well as incomes above 200.000 dollars in general. This figure has been obtained from* **(Chetty, et al., 2017)**.

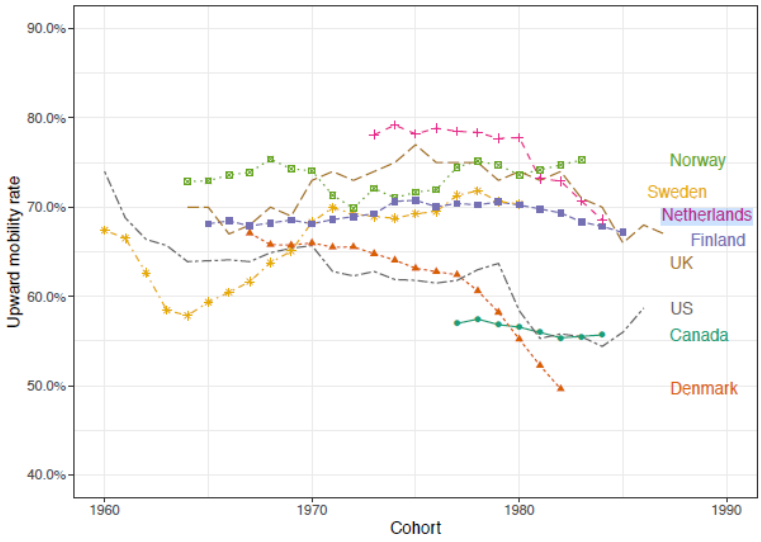


**Figure 72 Relative portion of the population experiencing absolute upward income mobility for various countries.** *Note: Upward mobility rate has been calculated as the total income of the family at the age of 30. Results are based upon the article's author's calculations using register and survey data from the specific countries. This figure has been obtained from* **(Manduca, et al., 2020)**.

### *Relative mobility*

Relative mobility reviews the size of income or wealth from one person to another. When a person has a smaller/larger growth compared to another person, he/she can change in position, an example is shown in Figure 71. Relative mobility can be measured for various parameters with the most common being status mobility, class mobility, individual earnings, and family income (Torche, 2015). These parameters are (mostly) measured by intergenerational differences between parents and children. For example, economic mobility can be measured by the elasticity of the parent's earnings to the child's earnings, or the parent's earnings rank compared to the child's earnings rank. On the other hand, sociological parameters often make use of an integration of various parameters such as education, employment, earnings, wealth, and health. Interestingly, the sociological parameters and the economic parameters are not per se correlated in

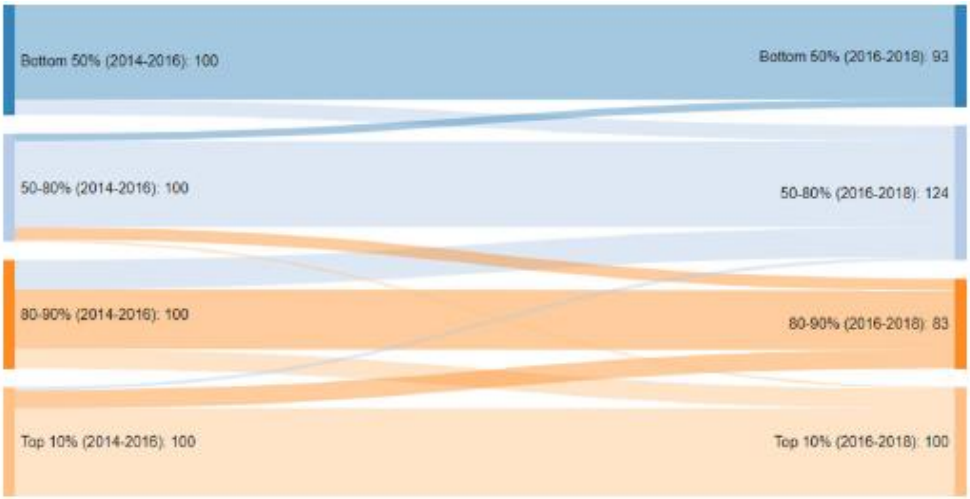


Figure 71 Relative wealth mobility within the UK. *Note: Relative mobility measured as change in value between 2014-2016 and 2016-2018 WAS measurements. Wealth is measured according to the household. This figure has been obtained from* (Advani, Bangham, & Leslie, 2021).

having the same outcome. While economic mobility is closely related to economic inequality, sociological mobility is only weakly, or even uncorrelated, to economic inequality (Torche, 2015). While this difference is interesting, this thesis concerns economic inequality and therefore will keep its focus on (only) economic mobility.

Overall, it can be found that there is a large variance in economic mobility across various nations, as shown in Figure 73. Corak (2016) shows that on an international level, differences can be seen between developed and developing countries. The general notion is that developed countries experience relative more mobility than developing countries and that countries with higher inequality experience less mobility. The consequence of the difference in mobility can be exemplified by a hypothetical case comparing the situation of Denmark with that of Peru (they respectively have an intragenerational earnings elasticity of 0.15 and 0.67).

In the hypothetical case, when Peruvian person A earns 100% more than another Peruvian person B, then the son of A will earn 67% more than the son of B. In the next generation, their sons will have a difference in income of 45 (and so on). To close the gap of income <5% between these two bloodlines, it will take 8 generations, i.e., 240 years. However, in Denmark, the same hypothetical case will only need two generations, i.e., 60 years, to close the gap to <5%. Thus, the difference between an elasticity of 0.15 and 0.67 causes that it will take 180 years more to close income differences. As such, differences that occurred right after the Second World War have been resolved in Denmark while Peru is still being impacted by income differences which were present in the year 1842 when the TU Delft was founded by King William II. As such, detesting economic inequality is one issue, but (low) economic mobility is another and has its influences for long periods of time.

It is important to realize that economic mobility is an aggregate of various sub-units with differences occurring between different income groups. For example, the middle-income group has a high mobility in contrast to high- and low-income groups which are having low mobility (Corak, 2016). Or reviewed from an ethnic level, the immobility among the low-incomes within the US is more pronounced for the black

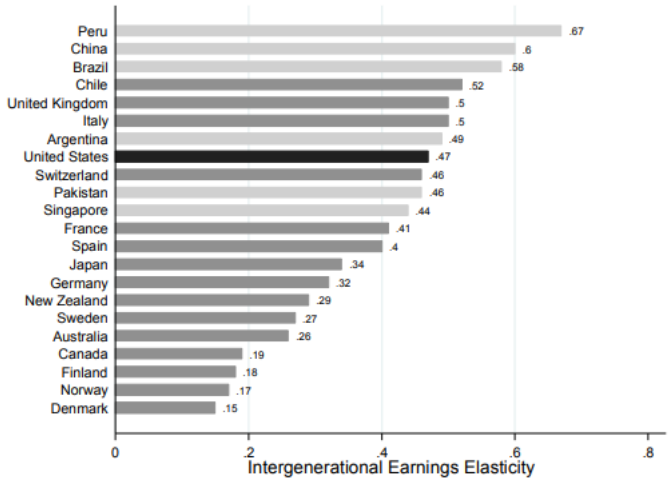


**Figure 73 Intergenerational income elasticity between father-son earnings over twenty-one countries.** *Note: Lightly shaded countries indicate non-OECD countries which have (in general) a lower mean income. This figure has been obtained from* **(Corak, 2016)**.

community or single parents compared to other groups. Moreover, Hansen (2014) found that wealth mobility is more limited when compared to income mobility due to its dependency on wealth transfers. This leads to the retention of wealth among a small group which is dependent on the wealth background of the family causing a closed group of wealth owners at the top of the wealth distribution.

Moreover, in the respect of measurements of mobility, it is important to note that there is an important difference between individualistic and household incomes. This is caused by the fact that household income is more capable of including the effects of assortative mating and can adjust for income decisions. For example, in a household, it is not uncommon for one of the parents to sacrifice his/her career in favour of parenting offspring and enabling the other parent to progress his/her career perspectives (Torche, 2015). However, I will refrain from investigating mobility in-depth for different sub-units as it would be too specific for the general concept of this thesis. However, from a policy perspective, these differences can be important for a targeted approach and can make redistributive policies more efficient.

### *Related aspects*

While we explained and discussed relative and absolute mobility separately, it could potentially be a wrong perspective. Chetty et al. (2014) show the presence of an interaction by finding that characteristics of absolute and relative mobility are overlapping in numerous regions, as shown in Figure 74. They connect these regional effects to the variance in income mobility to five different factors: 1) segregation 2) inequality 3) school quality 4) social capital and 5) family structure. Potentially these differences in correlation can be explained due to differences between countries. The fact that absolute and relative mobility are correlated would cause that policies which attempt to improve relative mobility for poorer families can improve their absolute outcomes significantly (Chetty, Hendren, Kline, & Saez, 2014). However, it should be noted that the correlation between different types of mobility differs per country and, as such, are difficult to be generalized for all countries (2021). Moreover, one should not be blind-sighted by the notion that the correlation is certain. For example, Manduca et al. (2020) actually state that there is no correlation between relative and absolute mobility. While I will not be able to bring a definitive statement as to whether the correlation exists or not, its potential can be of importance.

Next to the more technical aspects of economic mobility and the potential interconnection, there are also other concepts related to it and causes of its effects in the social domain. For example, economic mobility is at the centre of the national ethos of the United States, i.e., *the American Dream*. The idea revolves around the possibility for every person, regardless of socioeconomic background, to become rich and famous (Adams, 1931). As such, the American Dream glorifies the possibility of relative mobility, everyone can settle among the richest persons if one studies and works hard.

This focus on the winner mentality, i.e., the ability to improve income, has resulted in an interesting by-effect which is formulated in the "*prospect of upward mobility*" (POUM) hypothesis. The essence behind the POUM hypothesis is that people earning less than the average population oppose redistribution of income and wealth as they expect themselves to be able to obtain higher income in the future. The idea that their future selves, or their children, will be residing in the upper deciles of income and wealth

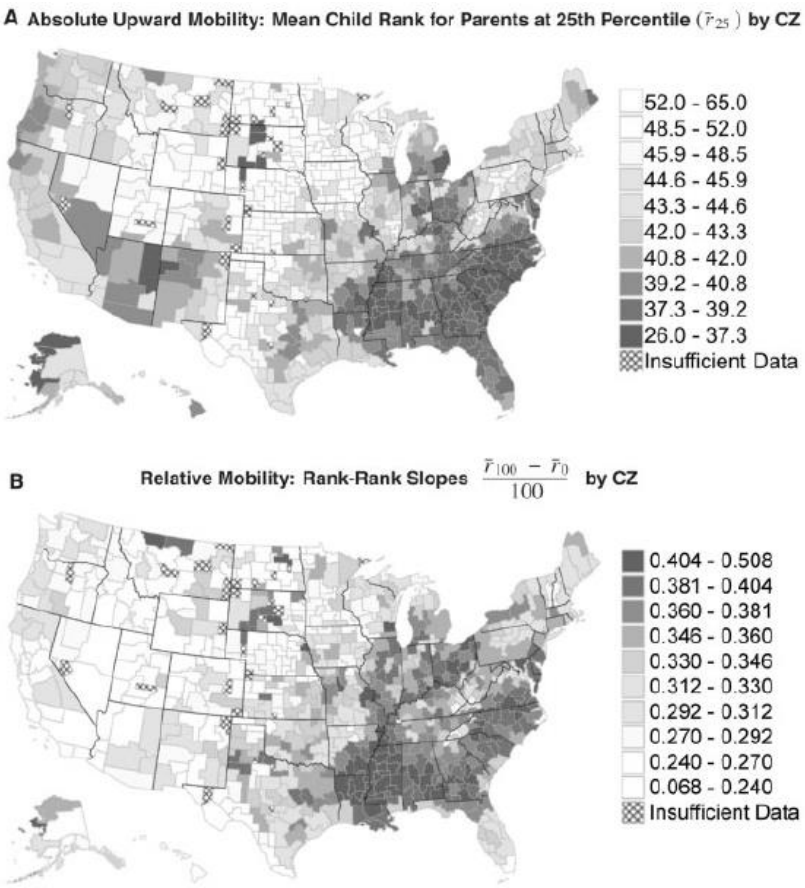


**Figure 74. Correlation between absolute (top panel) and relative (bottom panel) mobility with the US.** *Note: The data represents outcomes for birth cohort 1980-1982 per zone. The lighter areas represent the portion of children experiencing absolute mobility (top panel) and the correlation between parent's and child's income rank (bottom panel) (low values indicate low correlation and vice versa). Checkerboard areas have less than 250 parent-children coupled data and are regarded as having insufficient data. This figure has been obtained from* **(Chetty, Hendren, Kline, & Saez, 2014)**

distribution causes the perception that redistributive policies would negatively affect their perceived future high income/wealth (Benabou & Ok, 2001). Cojocaru (2014) showed that the POUM hypothesis is not only relevant to the United States but also to EU countries. However, there are three conditions which need to be met before POUM will be valid (Benabou & Ok, 2001):

1. There is the belief that the current policies will persist into future times
2. There needs to be low-risk aversion, as redistribution would bring more certainty of increased income and wealth than economic mobility as downward mobility is also an option.
3. The people need to have a belief that an increase in income and wealth is a possibility

## Equality of Opportunity

The key notion to opportunity (in)equality is that similar inputs provided by individuals lead to similar output. For example, individuals with similar intellect should be able to obtain similar educational outcomes, and similar educational outcomes should

lead to similar job opportunities. As such, the base for "success" is based upon merit and the input provided by an individual. In this section, notions revolving around differences in input and opportunities to equalize output will be discussed. However, it will be kept brief as this topic slides towards the intrinsic aspects of inequality which is not within the scope of this thesis.

In short, equality of opportunity envisions inequality as an honest outcome if the input provided is similar, which can be distinguished into two different elements (Hufe, Kanbur, & Peichl, 2018; Marrero & Rodriguez, 2012):

1. Effort: the various parameters which can be influenced by the person itself. For example, the amount of time and training invested to acquire a certain skill
2. Circumstance: the various parameters which cannot be influenced by the person itself. For example, gender, race, and a person's physical dimensions.

The importance of these two elements is that effort is valued as an individual task while circumstance is valued as outside of the influence zone of the individual. Because of this, 'effort' is deemed to be an acceptable source of inequality whereas 'circumstance' is deemed to be an unacceptable source of inequality. Therefore, policies ought to be targeting parameters involving circumstances (Hufe, Kanbur, & Peichl, 2018). In other terms, the goal is creating complete equality of opportunity such that economic hierarchy is the result of differences completely based upon 'effort' (Arneson, 2015).

However, equalizing circumstances among the whole population is most probably an impossible task. It requires that everyone gets the same opportunity to obtain an education, equal nutrition, equal access to the internet, equal access to cultural events, and so on. To obtain complete equality in every field will be a large financial burden and is (inherently) impossible to obtain (Arneson, 2015). Therefore, some form of analysis is needed to indicate which parameters can be equalized which quickly becomes a political opinion as to which parameters need investments and which do not.

However, while one might perceive that the problems revolving around opportunity inequality can be resolved when all circumstances have been equalized (creating fair chances based upon effort), it does not solve automatically lead to inequality which can be deemed ethical (Hufe, Kanbur, & Peichl, 2018). The main issue is that equality of opportunity does not set any boundaries to the economic ladder, i.e., there is no upper and lower limit to income earned. The main problem occurs with the absence of a lower limit, as people have a set of minimal needs which needs to be paid for. Therefore, Hufe et al. (2018) state that one should adhere to the principle that individuals have a right to have "Freedom from Poverty". As such, society is ethically obliged to supply at least minimum living standards for every individual. As equality of opportunity does not necessarily guarantee minimum living standards, Hufe et al. (2018) attempted to measure fair and unfair inequality with the latter taking into account fair inequality and the right to have "Freedom from Poverty". They found that not only fair inequality has grown, but also unfair inequality has become of larger importance relative to fair inequality. To be specific, from 1995 to 2012 52% of the increase in inequality could be contributed to an increase in unfair inequality, as seen in Figure 75.

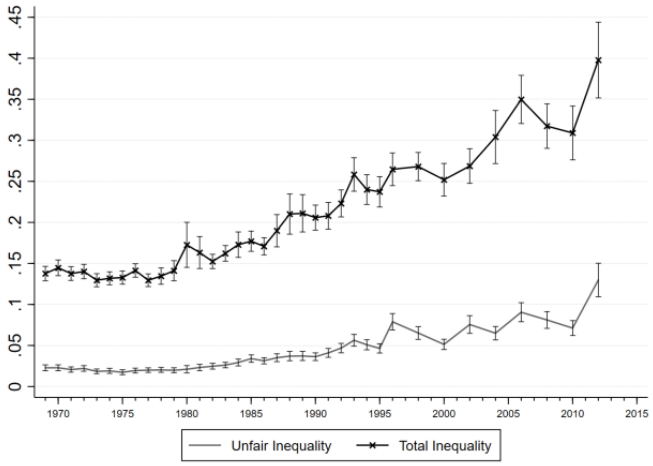


**Figure 75 (Unfair) Inequality through the years.** *Note: Data represents inequality (black line) and unfair inequality (grey line) in the US between 1969-2013. Black crosses indicate calculated total inequality using mean log deviation with 95% confidence intervals based upon the bootstrap procedure. The article's authors used PSID public dataset and PSID-CNEF. This figure has been obtained from* **(Hufe, Kanbur, & Peichl, 2018)**

Next to discerning what fair and unfair inequality are, one can also attempt to consider how equality should come into effect. For this, there are also two fundamentally different procedures concerning how equalization can occur (Fleurbaey & Peragine, 2013):

1. *Ex-ante procedure:* everyone has the same set of possibilities regardless of their circumstance
2. *Ex-post procedure:* everyone who puts the same amount of effort into a venture obtains the same outcome

Fleurbaey & Peragine (2013) explain that these procedures are conflictive in nature, one can either perform one or the other, but one cannot apply both. In essence, the ex-ante procedure evaluates the difference in circumstances, not yet including the performed effort by the entities. This procedure emphasizes equalizing circumstances between entities and assumes that the occurring differences will be the consequences of effort. In the ex-post procedure, both the circumstances and the effort are being measured. As such, it attempts to measure if an equal effort has been exerted and if so, attempts to equalize the outcome. From their analysis, they conclude that the ex-post procedure should be preferred as the ex-ante procedure can create the false belief that circumstances have effectively been equalized and the remaining consequences are the result of differences in effort. Moreover, Fleurbaey et al. (2017) state that the ex-ante approach also neglects the interaction between effort and circumstance. I will refrain from explaining how to implement these methods but highlight that "How to equalize opportunity?" has a field of analysis on its own which needs to be considered.

## 3.4 Chapter Conclusion

In this chapter, the parameters which are resulting in economic inequality have been discussed. In broad terms, it has been found that numerous parameters affect income and wealth inequality, and they are frequently interconnected, but mostly the top of the

income and wealth distribution have seen an incredible increase when compared to other groups. However, it is difficult to distinguish cause and effect, as the effect is also affecting the cause. Moreover, while various parameters can be recognized, it is seemingly impossible to recognize the most pivotal parameter. Almost every research reports various ifs and maybes and states that their researched parameter is part of a large system.

Even if parameters are known and are susceptible to governmental policy, it is tremendously difficult to effectively intervene in unwanted processes. A prime example of such a problem is the Child Poverty Act 2010 in the UK. The British government attempted to abolish child poverty and improve mobility through the Child Poverty Act 2010. At the launch, it proposed various interventions such as combatting the entrapment of the low socioeconomic positions, mostly through poor education prospects, and advised improving lower education (Social Mobility and Child Poverty Commission, 2013). However, it has been a large failure, in 2013 it already became clear that the goals set for 2020 were "almost totally out of reach". The relative poverty would be twice as high as the set goal and the absolute poverty a stunning five times the set goal (UK Parliament, sd). It was in 2015 when the Child Poverty Act 2010 was replaced with new legislation (Department for Work and Pension, 2015).

While serious attempts have been taken to tackle child poverty and mobility, the attempts fail because of economic downturns hampering intervention (UK Parliament, sd). Moreover, doubt was created about the analysed parameters stating that new multidimensional parameters would be more effective in quantifying the desired outcome (Secretary of State for Work and Pensions , 2012). Sadly, not everything is in our control, even knowing which parameters are of influence and which parameters are to be tackled, the complexity will continue to form a struggle when attempting to address and alter inequalities.

## Conceptual model's building blocks

To complete the analysis for this chapter, the following 'building blocks' have been synthesized for the conceptual model.

# 1. Income inequality

*a. Income Inequality – Taxes & Benefits*

Because of (increased) top marginal tax, top incomes have reduced incentives to bargain for higher incomes and total incomes are made more equal.

*b. Income Inequality – Labour Bargaining*

Because of (increased) labour bargaining, low incomes can obtain higher wages and top income positions are reduced and receive lower wages.

*c. Income Inequality – Welfare State*

Because of the welfare state, institutional designs are possible such as minimum wage which helps in reducing income inequality by aiding low incomes.

*d. Income Inequality – Technology*

Technology increases the capital share from income when mechanization occurs but can also decrease the capital share of income when innovation occurs.

*e. Income Inequality – Globalization*

Because of globalization, larger opportunities exist for capital to "find" higher returns and labour positions have less bargaining power due to larger competition.

*f. Income Inequality – Financialization*

Because of financialization, top incomes have various methods to increase their wages using financial assets which are not available to low-wage jobs.

*g. Income Inequality – Wealth Inequality*

As wealth and income distributions are correlated, the returns from capital are primarily concentrated in the higher income portion of the distribution.

*h. Globalization – Financialization*

Because of globalization, it has become possible to transfer wealth across the globe for investment opportunities which can fuel the occurrence of financialization.

# 2. Wealth inequality

*a. Wealth Inequality – Taxes & Benefits*

Wealth inequality can be sustained at large due to favourable tax policies on wealth (transfers).

*b. Wealth Inequality – Real Estate*

Wealth inequality runs along with real estate ownership where real estate owners have favourable returns on capital whereas non-real estate owners need to pay (via rent) for living accommodations.

*c. Wealth Inequality – Financialization*

The accumulated wealth can be invested into financial assets which have larger returns on investment than saving rents among low-wealth owners causing an increase in inequality.

*d. Wealth Inequality – Wealth Transfers*

Families with wealth are enabled to transfer wealth along sanguine lines which positively correlates with wealth accumulation among recipients.

## 3. Economic ladder

*a. Mobility – Income Inequality*

Inequality and mobility are negatively correlated with each other. Moreover, if there is the fluidity of poor people also being able to become rich at one point in their lives, then inequality would be less of an issue.

*b. Mobility – Education*

Mobility is largely enhanced by increased education which enables obtaining a high-wage position and flexibility in the number of job positions available.

*c. Mobility – Real Estate*

Mobility is largely stratified according to the lines of real estate ownership having segregation in the household with and without real estate.

*d. Mobility – Wealth Transfers*

Mobility is stratified according to wealth transfers, those who receive (in vivo) wealth transfers enable gaining favourable (socio-)economic positions.

*e. Mobility – Stratification*

Segregation of society potentially aids in creating positive/negative effects for social clusters which (negatively) impacts mobility.

## 4. Redistribution policy – One for all, and all for one?

So far, the thesis has discussed how economic parameters can be quantified, and the cause & effect of economic inequality. In this last describing chapter, tax & benefits policies will be discussed which is one of the most influential policies a government can draft to directly alter economic inequality (Bourquin & Waters, 2019). In short, this is achieved by the ability of taxation to subtract income or wealth from people while benefits can give (monetary) support to individuals.

When considering taxes & benefits for their potential to cause redistribution, it is important to realize that they have essential differences. For example, taxes are primarily based upon individual earnings while benefits are frequently based upon household income. Moreover, taxes are often incurred for a fixed period of one year while benefits can be distributed in times of need for varying periods which can be for a period of only a few months (Mirrlees, et al., 2011). These differences cause that an individual could be paying both taxes and receiving benefits at the same time. The importance of this duality is that it can affect tax payments and benefits received when they are not reviewed properly, as is shown in Figure 76. As such, it is ill-advised to review the two items too much as separate entities and one should approach the tax & benefits system as one coherent system (Mirrlees, et al., 2011).

The importance of taxes and benefits also differs according to the desired target of the policies, i.e., reducing poverty, improving low-income, or enhancing redistribution (Brady & Bostic, 2015). However, having one goal in mind does not immediately cause that another goal is also achieved. For example, a policy designed to cause redistribution does not immediately cause an improvement of low income. This is explained by the example that levying higher taxes on high income would reduce inequality but does not improve the wages of the poor. Another example is that a tax reduction for low-income wages does not automatically reduce poverty as the impoverished can have no income and thereby have no positive effect from such a policy. In general, it is an erroneous mindset to automatically assume that a policy affecting one aspect will transcend its effect to another aspect.

When reviewing tax and benefits by their effect on inequality, it can be found that countries rely more heavily on their benefits program to affect inequality as compared to their tax program (Joumard, Pisu, & Bloch, 2013). On average, the impact of the benefit programs is about 2 to 4 times as large when compared to taxation, as shown in Figure 77. In the more recent evaluation of the UK tax and benefit system by Bourquin & Waters (2019), they found similar values with benefits having four times as large an effect on

| | Simultaneous assessment | Tax assessed first (means test on after-tax income) | Benefit assessed first (benefit taxable) |
|---|---|---|---|
| Extra earnings | **£100** | **£100** | **£100** |
| Extra tax due | 31% of 100 = **£31** | 31% of 100 = **£31** | 31% of (100–39) = **£19** |
| Benefit withdrawn | 39% of 100 = **£39** | 39% of (100–31) = **£27** | 39% of 100 = **£39** |
| Extra net income | 100 – 31 – 39 = **£30** | 100 – 31 – 27 = **£42** | 100 – 19 – 39 = **£42** |

**Figure 76 Interaction between taxes and benefits.** *Note: This figure has been obtained from (Mirrlees, et al., 2011)*

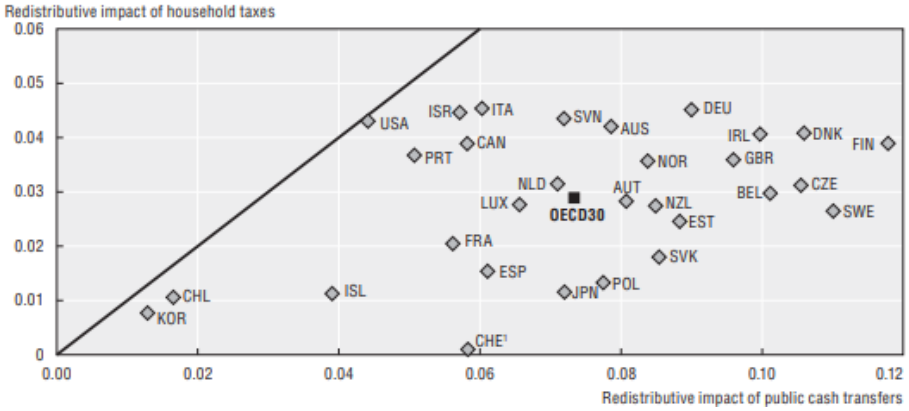


**Figure 77 Redistributive impact of taxes and benefits on household income.** *Note: The redistributive impact of taxes is measured as the difference in the concentration coefficient of market income and total income. The redistributive impact of benefits is measured as the difference in the concentration coefficient of total income and disposable income. The results are based on the author's calculations using the OECD Income Distribution and Poverty Database for the late 2000s. This figure has been obtained from* **(Joumard, Pisu, & Bloch, 2013)**.

reducing inequality as compared to direct taxes while indirect taxes were found to be to even have a negative impact on inequality.

However, it should be reminded that these previous values are aggregates and stark differences certainly occur. In a broad scope analysis of Luebker (2011), he found that there are distinctive different systems, as shown in Figure 78. For example, he showed that both Latin America and East Asia offer only limited redistribution even though they experience stark differences in inequality. This is in contrast to Europe and another group of countries which attempt to cause redistribution but differ in their dependency on either taxes or benefits, i.e., 1/3$^{rd}$ of the redistribution occurs through taxes for the group of countries as compared to 1/5$^{th}$ in Europe.

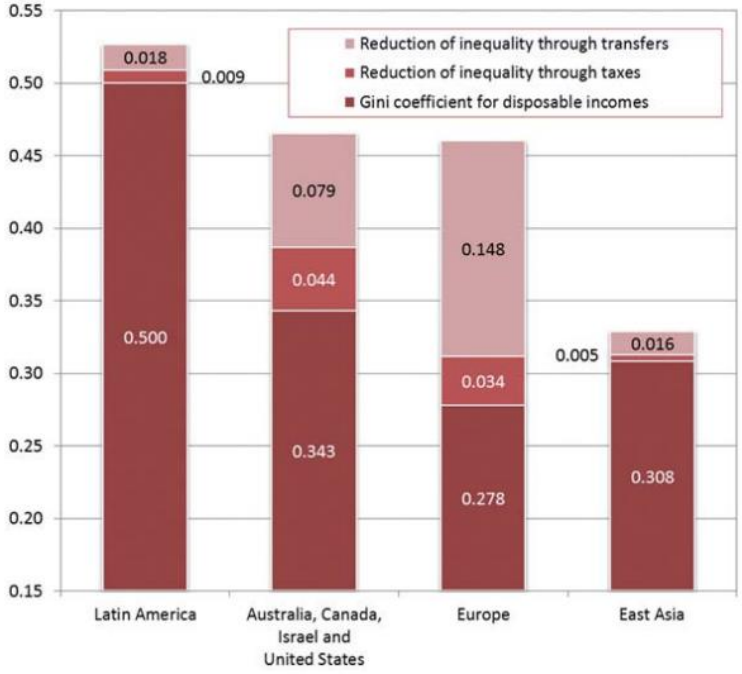


**Figure 78 The impact of benefits and taxes on the Gini coefficient.** *Note: The columns represent market income, i.e., before taxes and transfers. The results are based upon the Luxembourg Income Study database with data retrieved around 2000. This figure has been obtained from* **(Luebker, 2011)**.

Before venturing into the topic of taxes and benefits in more depth, it is important to stay vigilant about the ulterior goal of a government. For this Oishi et al. (2012) states that the general task of a government is to address the subjective well-being of its population which correlates with progressive taxation and other parameters. Interestingly, progressive taxing increases happiness among the poor due to improvements in equality but does not cause reduced happiness among the rich (Oishi, Kushlev, & Schimmack, 2018). However, it should be noted that the mediating factor in the correlation was the quality of public and common goods provided by the government (Oishi, Schimmack, & Diener, 2012). As such, it is not only the redistribution which is of importance, but also how it is spent which (in part) relates to the benefits system. In general, it is important to realize that equality is not the end goal, it is a means to an end. As exemplified by a quote from Hufe et al. (2018), the end goal of what a government wants to achieve gives direction to its policy design:

> *"This suggests to re-shift the recent focus of attention from the upmost parts of the income distribution to the lower percentiles if the issue at stake is unfairness instead of a mere description of aggregate inequality"* – P. Hufe et al. (2018, p. 29)

## 4.1 Taxation

Taxation is a very old concept that traces back to ancient times and various large theories concerning taxation have already been developed in the 18th century. (Trotman-Dickenson, 1996). However, taxation has not been standing still over the course of time. The size of taxation has changed and has become of much larger importance within the economy (Piketty, 2014), as shown in Figure 79, and correlates with the change in the purpose of taxation. Until several decades into the 20th century, the main purpose of taxation was to create revenue to support government expenses. Only from the late 20th century, it has also been reviewed as a tool to shape the economic distribution (Trotman-Dickenson, 1996). As of today, taxation as a system is still a developing field and attempting to optimize its workings both in theory and in practice (Mirrlees, et al., 2011).

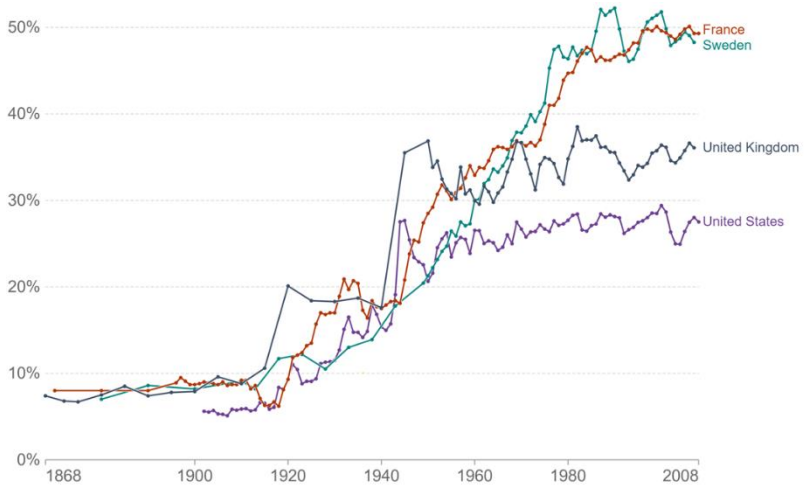


**Figure 79 Revenue generated from taxation as a share of national income.** *Note: Results are based upon data from Piketty* **(Piketty, 2014)**. *This figure has been obtained from* **(Ortiz-Ospina & Roser, 2016)**

There are various taxes available for a government to generate revenue, as shown in Figure 80. However, to limit the scope of this thesis only a subset of taxes will be reviewed which are incurred by citizens individually. These are direct (income) taxes, wealth (property) taxes, consumption taxes (VAT/sales taxes), and social contribution taxes (Trotman-Dickenson, 1996). While it could be that other types of government revenue generators also influence economic inequality, their limited presence in the tax revenue generation, as shown in Figure 81, makes me believe that their impact will most likely be limited and less worthwhile to be analysed in this particular thesis.

However, it is worthy to note that not only the relative importance of the different taxes differs, but also that taxation starkly differs between nations, as shown in Figure 82. In broad lines, the developed countries excise larger income taxes compared to developing countries. This in part has to do with the administrative abilities to administer taxes. To circumvent the administrative inabilities, developing countries resort more often to consumption taxes which are easier to administer and collect as opposed to income and wealth taxes (Ortiz-Ospina & Roser, 2016). As such, it is important to realize that every nation has its own tax system and has its specific relative importance for every type of tax. Thus, while hereafter individual tax types will be discussed, it is to be warned off to make (excessive) generalizations as every nation will have its unique features.

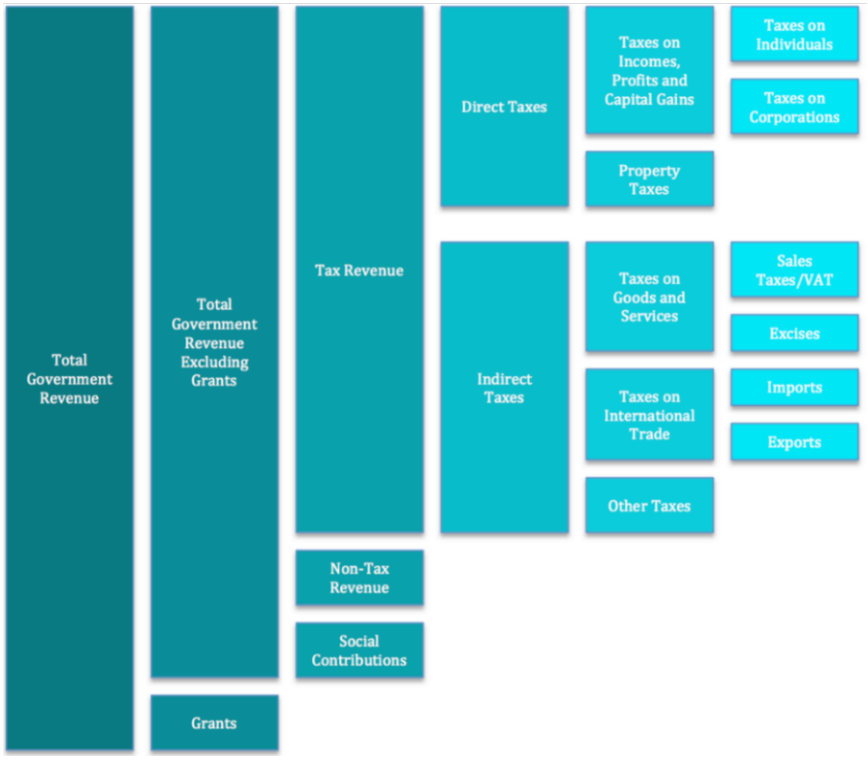


**Figure 80 Model of government revenue generation.** *Note: This figure has been obtained from* **(Prichard, Cobham, & Goodall, 2014)**.

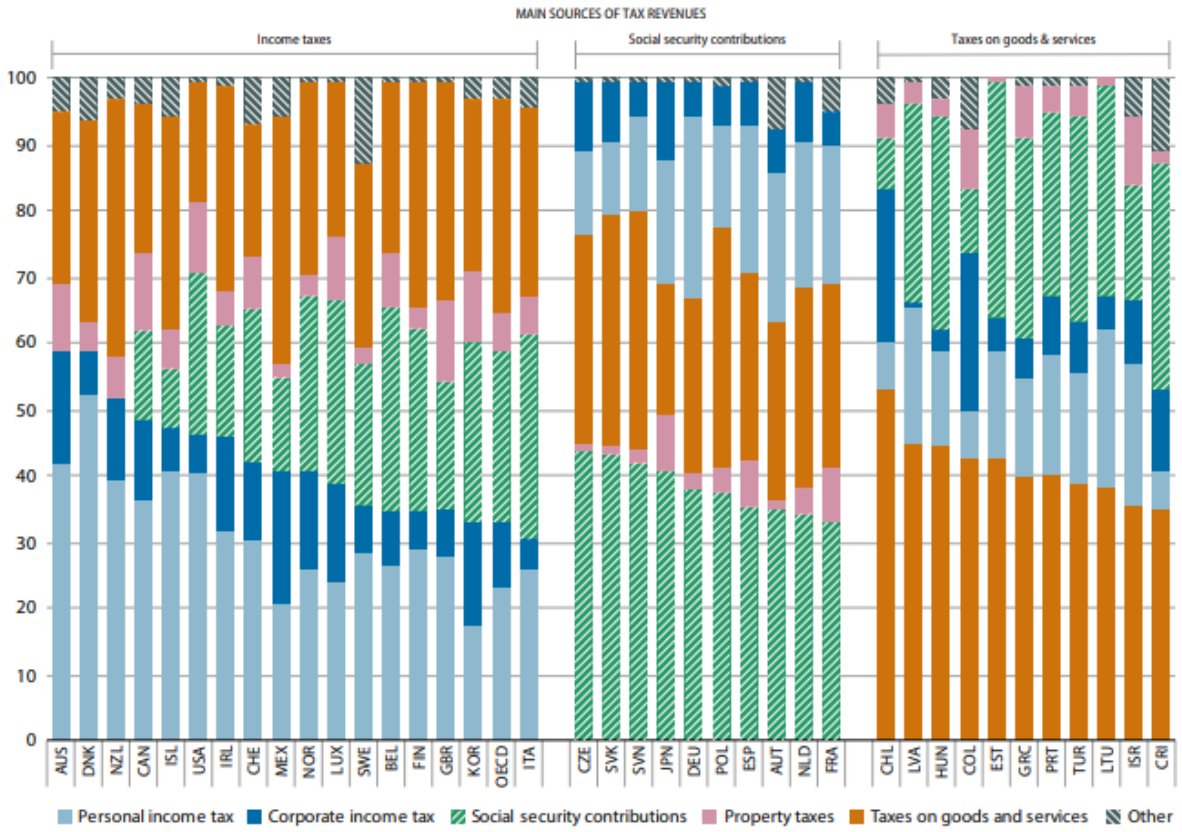


**Figure 81 The relative importance of various taxes as a share of the total tax.** *Note: Nations are grouped per dominant tax revenue source, i.e., Income taxes, social security contributions, or tax on goods & services. Results are based upon the author's calculations using the data of the OECD from the Revenue Statistics database in 2021 This figure has been obtained from* **(OECD, 2021)**

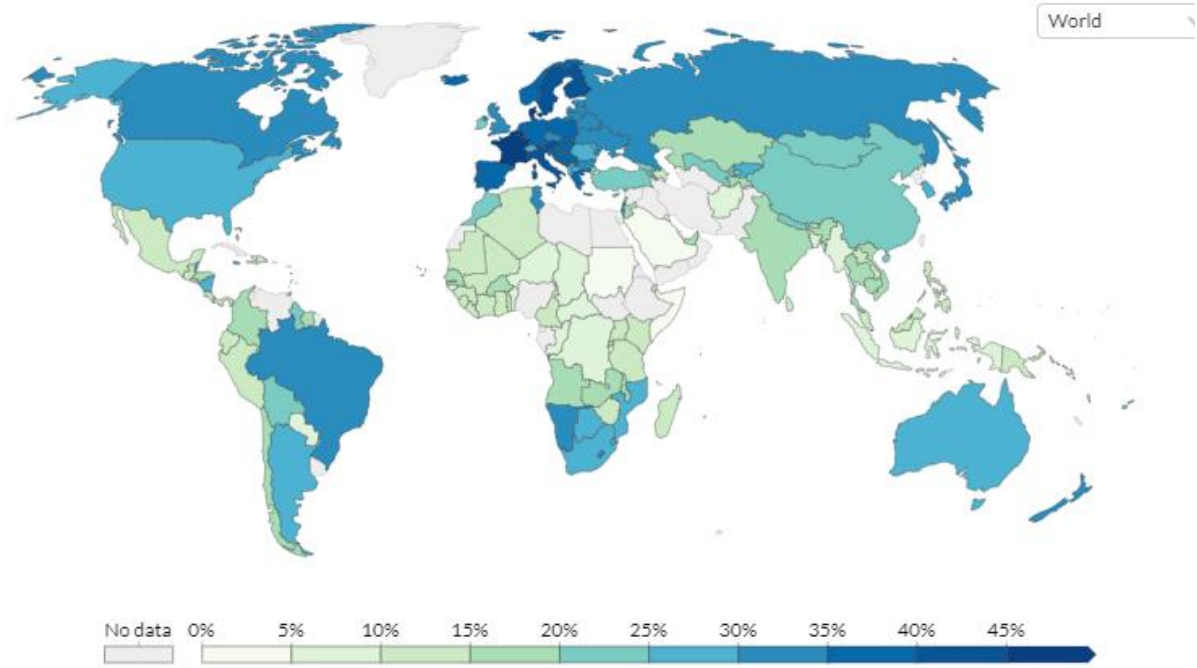


**Figure 82 The total tax revenue as a relative share of the GDP per country in 2020.** *Note: This figure has been obtained from* **(Ortiz-Ospina & Roser, 2016)**.

## General construct

Before starting the review of the individual taxes, some critical basic concepts need to be explained to be able to adequately comprehend the understanding of the upcoming sections. For the sake of clarity, these concepts will be reviewed along with the following six items: 1. Requirements individual taxes, 2. Tax formats, 3. Differentiating between entities, 4. Distinction between direct & indirect taxes, 5. Burden of taxes, and 6. Requirements tax system. However, it should be noted that this list is (potentially) incomplete as it is a compilation of my own making. Nonetheless, I do feel that this list of items gives the proper background knowledge to understand the narrative in the other sections and, as such, suffices for what is needed for this thesis.

### 1. Essential requirements for individual taxes

It has already been recognized by Adam Smith in the 18th century (and famously formalized in The Wealth of Nations (1776)) that individual taxes should comply with the following four requirements: 1. Taxes should be proportionate to income or abilities to pay, 2. Taxes should be incurred with certainty rather than arbitrary, 3. Taxes should be paid at times and in ways convenient to the taxpayer, and 4. Taxes should be cheap to administer and collect.

However, since the date of writing those principles and the present time, various economic changes have occurred. As such, Trotman-Dickenson (1996) describes four more principles that should be adhered to: 1. Flexibility to adjust for a change of (economic) conditions, 2. Minimalization of economic disruption, 3. Avoidance of double taxation (potentially occurring through international economic activities), and 4. Adaptability to adjust for (changing) redistribution preferences. Similar extensions, with some subtle differences, have been drafted in the Mirrlees Review[10] (Mirrlees, et al., 2011): 1. Minimization of negative effects (on welfare and economy), 2. Reduced administration and compliance costs, 3. Fairness in treatment, and 4. Transparency (one should be able to understand the taxing logic).

### 2. Tax formats

One of the most fundamental aspects of taxes is their format. The format decides which impact the tax is designed to have on the distribution. As such, the format holds for every type of taxation, direct or indirect. There are four fundamental formats from which other type formats can be seen as combinations or alterations of these specific designs (Trotman-Dickenson, 1996):

a) *Flat:* Everyone pays the same lump sum as tax, e.g., every citizen pays 100 euros.
b) *Proportional:* Everyone pays relatively the same relative amount of tax, e.g., 10% on income.

[10] The Mirrlees Review is an extensive review of the UK tax system under the chair of Nobel laureate Sir James Mirrlees. I will use The Mirrlees Review frequently as a point of departure to review specifics taxes and general concepts. Reason for doing so is the fact that it is recognized as being a canonical work, as exemplified by Auerbach (2012), i.e., *"… it (The Mirrlees Review) clearly must be considered a major compilation and synthesis of current thinking on what constitutes good tax policy.",* and Feldstein (2012), i.e., *"Any student of tax policy would benefit by reading it carefully and critically"*.

c) *Regressive:* The average tax rate decreases with increasing income/wealth, e.g., the first income bracket pays 20% tax, the second bracket 10%, the third bracket 5%, etc.
d) *Progressive:* The average tax rate increases with increasing income/wealth, e.g., the first income bracket pays 5% tax, the second bracket 10%, the third bracket 20%, etc.

### 3. Differentiating between entities

In a tax system, it is required to gain (personal) information to be able to differentiate the amount of tax to be paid. Even for the most simplistic format, i.e., flat tax, it will be required to be aware of the taxable population. As such, questions need to be answered such as who is alive as one cannot tax dead people (with the exception of the inheritance tax discussed later), the individual's age (often children are exempted from taxes or their tax burden is transferred to their parents), and the place of residency (various taxes are only paid when living inside the country). If a tax format is chosen which is dependent on income and/or wealth, the information becomes increasingly more complex as the type of income needs to become known (tax rates differ per type of income) and need to be registered for multiple years (recalls and exemption cans be based upon previously paid taxes).

The method used to differentiate the size of taxation between citizens is called 'tagging', as coined by Akerlof (1978). The general idea behind tagging is that it creates the ability to adjust the size of taxes by the specified tags, for example, marital status, parenthood, household composition size, and age. In general, tags are applied to distinguish citizens according to their ability to pay taxes (as imposed earlier by Adam Smith (1776)), but various other reasons can exist such as being able to specify benefits. However, tags are not always socially desired to be used as a differentiating parameter for taxes. For example, the tags gender, race, and educational level of the parents are perceived to be unethical. The differentiation of whether a tag is considered ethical or not is based upon the ability of a person to influence that specific parameter (Akerlof, 1978). Fixed parameters, e.g., race, are deemed unethical as they are based upon circumstance and cannot be altered by personal input (effort). Moreover, it is also desired that the tag complies with the horizontal equity principle, i.e., treating similar people similarly, and efficiently contributes to vertical equity, i.e., the attempt to redistribute from the haves to have nots (Mankiw, Weinzierl, & Yagan, 2009; Trotman-Dickenson, 1996).

### 4. Distinction between direct & indirect taxes

An important difference between various taxes is that they can either be specified to a specific person, i.e., a direct tax, or can be levied on a transaction/consumption of a commodity, i.e., indirect tax. Following the narrative of Trotman-Dickenson (1996), the differences between these two types of taxes have been summarized in Table 3. These aspects of direct and indirect taxes can give direction to what is possible and what is not. The general notion important to this thesis would be that direct taxes can cause redistribution whereas indirect taxes are (mostly) incapable of doing so.

Table 3 Merit and demerits for direct and indirect taxation. *Note: The characteristics are based upon the results of Trotman-Dickenson* (1996).

| **Direct** | | **Indirect** | |
|---|---|---|---|
| *Merits* | *Demerits* | *Merits* | *Demerits* |
| Equity | Complexity | Universality | Regressive nature |
| Certainty | Increasing costs of compliance | Limited scope of evasion | Distortion of consumer preference |
| Convenience | Tax evasion | Psychological palliative | Distortion of pattern of production |
| Known incidence | Disincentive effects | Optional nature | Inflationary effect |
| Avoidance of distortion in allocation of income | Taxpayer resistance | Flexibility | |
| Flexibility | | Simplicity | |
| Built-in stabiliser | | Low cost of compliance | |
| | | No disincentive to work | |
| | | Political appeal | |

## 5. Burden of taxes

Taxes will always cause a penalty on a transaction or commodity and will disincentivize this specific action (Mirrlees, et al., 2011). A tax always has a clearly described taxed entity which is called the legal incidence of the tax or differently mentioned, the entity that incurs the statutory burden of the tax. However, the officially taxed entity does not have to coincide with the entity that will pay the tax in practice. For example, excise taxes on tobacco are levied on the producer of the tobacco but can be valuated into the price and, as such, be paid by the consumer of the tax. This process of "Who pays the final bill?" is called the economic incidence or differently mentioned, the economic burden of the tax. The major importance of the burden of the tax is that it will always cause a loss of welfare, but it should be known who will bear the economic burden. This notion is important as the envisioned plan of a tax can differ from the practical consequences which can hamper the outcome of a policy.

## 6. Essential requirements of tax systems

While the individual taxes should comply with individual prerequisites, they should also complement each other to properly function as a system. For this, pivotal work has been performed in the Mirrlees review (Mirrlees, et al., 2011) and stated that a tax system has three key principles:

*I.Review the format as a system*

While individual taxes can be favouring or disfavouring inequality or, for example, have damaging consequences to the environment, they should be judged by the effect of the whole tax system. In essence, if the devised goals for a policy are obtained through the workings of the whole tax system, then the nature of individual taxes should be considered of lesser importance. The same holds for the devised benefits, they should efficiently cooperate within the benefits system but also in adherence to the complete tax system.

*II.Neutrality*

It is required that the tax system values similar activities similarly. The reason to favour neutrality in activities is that it is economically undesired to distort the system by giving (arbitrary) favourability to a certain activity over another. The

economic system (demand & supply) should guide pricing instead of artificial intervention. The added benefit of reviewing activities similarly is that the tax administration is not required to collect information to differentiate between activities. This makes the system less complex and requires less administration to keep track of differences. Moreover, differentiation causes an incentive for entities to reshape their activities to other activities which have favourable taxation rates. This requires control and legislation to avoid this from occurring. In general, neutrality is desired and strong arguments are needed to justify deviating from this practice. However, differentiation can be beneficial in some cases, for example: 1. Environmental harmful activities, 2. 'sin taxes', 3. pensions, 4. research & development, 5. education, and 6. childcare.

*III. Progressivity while retaining efficiency*

Taxation will always impose a burden on activities and distortion potentially causing changes in behaviour. It is therefore of importance to be aware of which response will occur upon implementation of a policy. For example, (young) parents (especially mothers) and close to retirees have a higher response rate to stop working upon increasing taxation rates. One should attempt to implement policies which cause the least amount of distortion to the system, acknowledging that the distortion can differ between population groups. However, one should be warned about confusing cause & effect as a change in policy can also promote perceived characteristics. For example, implementing a wealth tax to compensate for tax evasion & avoidance on (capital) income can cause increased evasion & avoidance in an attempt of the taxpayer to retain their former interest rates. As such, a policy can initiate activities that it was designed to combat.

## Income & social contribution tax

The first taxes to be discussed is income & social contribution tax. The combined impact on tax revenue generation of these two types of taxes is by far the largest in developed countries. In the report of the OECD (2021), it has been stated that they contributed somewhere in the range of 60-70% of all tax revenue for developed countries, as shown earlier in Figure 81. It has been chosen to discuss these two types of taxes combined as they are both incurred over income. As such, they have similarities in their effect on labour which would make a separate discussion of these taxes a bit superfluous. First, the differences between these two types of taxes will be considered, after which two important issues regarding these taxes, i.e., underreporting and labour disincentives, will be discussed.

There are four notable differences between income and social contribution tax. At first, income tax has its main goal aimed at redistribution (and gaining revenue) while social security contribution is an earmarked tax with the purpose of social security, e.g., unemployment insurance, sick & injury insurance, and retirement (OECD, sd). Secondly, income tax has its statutory burden solely on the employee while the social contribution tax has its statutory burden spread over both the employee and employer with varying ratios of tax dependence differing between countries (Torres, 2021). This split burden has the important consequence that social contribution interacts with both labour wages and corporate revenues and the tax should be reviewed in combination with corporate and

income tax simultaneously (Torres, 2021). However, as mentioned earlier, the statutory burden of the social security contribution lies is not automatically also the same as the economic burden. As shown by Melguizo & González-Páramo (2013), the economic burden of social contributions predominantly lies with the employee in the long run making it rather similar to the income tax. Thirdly, the design of income tax is often progressive (Joumard, Pisu, & Bloch, 2013) while social security contributions (with split statutory burden) are often regressive in design due to an upper contribution limit (OECD Tax Database, 2021). For example, within the US the social security contribution is 6.2% of the salary which is matched by the employer, i.e., 50% for the employer and 50% for the employee, with a contribution limit set to $9.114,-. This leads to an upper annual income tax limit of $147.000,- (U.S. Social Security Administration, sd). Fourthly, Goudswaard & Caminada (2015) explain that the perception differs between income tax and social security contribution as the latter is being socially accepted and therefore there are fewer negative consequences of social security contributions. This is in contrast to income tax for which the purpose is much more vague. This creates a sense of illegitimacy because it is being perceived as stealing money from well-earned income. Scheve & Stasavage (2012) highlighted this notion in the following quote regarding the fairness in treatment in the perspective of redistribution:

> *"A main lesson of our work is that support for progressive taxation is greatest when its advocates can make a convincing case that it is necessary to tax some individuals more heavily to compensate for some prior source of unfairness. In the absence of such an appeal, arguments that the rich should pay more simply because they have a greater ability to pay may fall on deaf ears."* – K. Scheve & D. Stasavage (2012, p. 101)

### *Underreporting*

A common problem with income and social contribution is underreporting. Mirrlees (1971) describes this problem as the revelation principle, i.e., the issue of information asymmetry between the principal and the agent. The principal, i.e., the tax collector, wants to implement a certain policy that can be obtained by enforcing taxes. However, the agent, i.e., the taxpayer, needs to be motivated to reveal his information, i.e., income, and be willing to have a tax imposed on him. If the agent is not incentivized to reveal his information, it will attempt to hide it. Duncan & Peter (2016) show an example of this issue where progressive income taxation causes an incentive to hide income to avoid taxation. In their research, they showed that progressive income taxation causes a decrease in observed/reported income, but it has a significantly smaller effect on true income.

A method to prevent under-reporting, i.e., causing the taxpayer to be willing to share income data, is by creating a tax system which provides the right incentive to show income and wealth to the principal. The Optimal Taxation theory states this can be done at best by implementing a lump-sum tax (Mankiw, Weinzierl, & Yagan, 2009). The idea is that the size of tax is uncorrelated to the size of income and as such, there is no reason to hide income data. Moreover, as everyone would pay the same value the bureaucratic costs are minimized as it is not required to measure tags and adjust payment accordingly.

However, a lump-sum is mentioned as undesired as it would impact the poor more harshly than the rich and, therefore, would be counter-effective to economic equality.

As such, when including social welfare (the desire for economic equality), the Optimal Taxation theory states that a progressive tax is favoured. However, depending on the income distribution shape, i.e., being either Pareto or log-normal distribution, the system should either be fully progressive or become regressive tax after a certain income (Diamond, 1998). In the most extreme theoretical application for a log-normal distribution, the top marginal tax rate should even become zero for the income higher than the second-highest income in the system (creating an incentive to be the person reporting the highest income). Overall, the principal idea behind reducing the tax rate at the top is that it causes lower average tax rates with increasing income and thus making it more favourable to report higher incomes.

However, Kleven et al. (2011) state that regardless of the tax system, attempts at tax evasion will always occur as paying taxes is always more costly than not paying taxes. Therefore, they propose the revelation problem can also be (partly) circumvented by using third-party reported income instead of using self-reported income. They showed that with third-party reports the tax evasion becomes close to negligible because the (fear of) detection of fraud is higher when another party reports the income causing it to be a deterrence for an attempt to commit tax evasion. Overall, they conclude that reducing the marginal tax rates is less beneficial when compared to rigorous tax enforcement in attempts to reduce tax evasion. Therefore, reduced marginal tax rates seem to be the lesser solution when compared to heightened enforcement.

### *Labour disincentive*

Another important common problem with income and social contribution tax is the influence on the labour market. This has been famously explained by the Laffer curve which relates tax revenues with taxation rates. The idea is that at the extremes there is no revenue generated because at 0% no tax is levied and at 100% there is no incentive to work because there is no financial reward. This interaction between labour and tax can be described by the elasticity of labour supply, i.e., the measure for the amount of labour supplied versus the amount of (effective) wage obtained. In essence, taxes disrupt a market as it decreases the amount of wage gained per labour input (Meghir & Phillips, 2010):

> *"An elasticity of hours of work with respect to the wage, say, is the proportional change in hours of work caused by a proportional change in the wage. So an elasticity of 1 means that a 10% increase in the wage will lead to a 10% increase in hours. So suppose for the sake of argument that someone is facing a 20% tax rate and that his wage elasticity is 0.5. Suppose the tax rate is raised to 22%. This represents a 2.5% reduction in the after tax wage; with the 0.5 elasticity, this would imply a 1.25% reduction in hours worked."* – C. Meghir & D. Phillips (2010, p. 205)

However, an important distinction for the elasticity of labour is that one should distinguish between the intensive and extensive margin of elasticity of labour supply. The intensive margin of labour supply is the number of hours worked while the extensive

margin of labour supply represents the decision to enter/exit the labour market. As such, the intensive margin operates as a smooth function of labour supply while the extensive margin functions as an on/off switch (Saez, 2002).

The differentiation between the intensive and extensive margin of elasticity of labour supply is of importance when reviewing specific population groups. For example, when reviewing the participation of low-educated employees, it is found that the number of hours worked barely changes with increasing taxation, i.e., the intensive margin, but their participation to stay within the job market is influenced, i.e., the extensive margin (Meghir & Phillips, 2010). In general terms, they either work or do not work, thus with rising taxation, they rather drop out of work than reduce the number of hours worked. This contrasts with educated employees for whom neither the labour supply nor the participation is influenced but the taxable income changes. In essence, they attempt to find different sources of income with more beneficial taxation policies (Meghir & Phillips, 2010).

Another example is that the elasticity of labour supply of women was higher than for men in all of the analysed countries by Evers et al. (2008) and has been supported by other articles (Keane, 2011; Guner, Kaygusuz, & Ventura, 2012). Evers et al. (2008) also showed that the elasticity of labour supply (at the intensive margin) for women was reduced by family status and the presence of children and increased with age. The evaluation of elasticities of labour supply also provides interesting tags for taxation. For example, Blundell & Shepard (2012) found that larger efficiency can be obtained by reducing tax rates when the children are of 'school going' age. While this is an example, the general advice is that elasticities are to be considered to retain high labour participation (reducing the disruption to the market) when tax reforms are devised.

In an attempt to reduce the labour disincentive and increase purchasing power of the population (ultimately designed to increase economic growth), the top marginal tax has been decreased over the past three decades (Ortiz-Ospina & Roser, 2016), as shown in Figure 83. On average, the marginal tax rate of the top earners decreased by 11% in the past 25 years within the OECD countries (Mankiw, Weinzierl, & Yagan, 2009). While the attempt has been valiant, this reduction in marginal tax rate is moving away from the theoretical optimal tax rate of accruing tax revenue. For example, Lundberg estimated

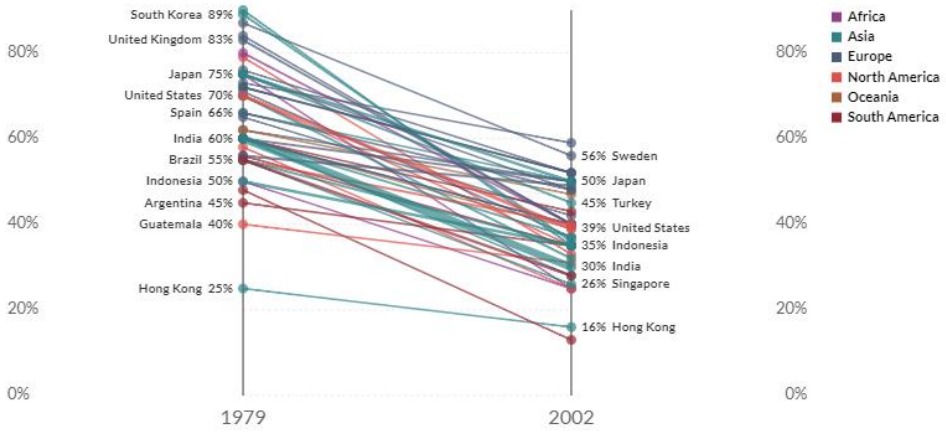


**Figure 83 Top marginal income tax rate for various developed countries between 1979-2002.** *Note: The results are based upon the author's inclusion of data from Reynolds* **(2008)**. *This figure has been obtained from* **(Ortiz-Ospina & Roser, 2016)**.

that the optimal tax rate for the OECD countries lies around 61 to 65% (Lundberg, 2017). Moreover, Kindermann & Krueger (2014) show for the top 1% income that the optimal taxation rate is even drastically higher, being around 89%.

The interest to optimize tax rates is caused by the that increased tax revenue generation can be used to enhance redistribution. Kindermann & Krueger (2014) state that this process is efficient due to the characteristics of consumption propensity being different for the poor and the rich, as explained earlier in section 1.4 under Consumption. They conclude that the increased top marginal tax rates would contribute to society as the loss in consumption and loss in labour productivity is limited for the high-incomes and the effect on social redistribution and increase in social insurance for low-incomes outweigh these effects.

However, it should be warranted that the effects of tax rate changes are time dependent, and distinctions can be made between short and long-run effects. For example, Kindermann & Krueger (2014) showed that the dramatic increase in marginal top-rate taxation for the top 1% will need 30-40 years before the system comes into a new equilibrium. During that time, the short-run effect will be that the government will have decreasing tax revenue from the top 1% due to adjustments in hours worked and the positive effects will be experienced in the long-run by providing a net gain in tax revenue

While it can be perceived that an increased top marginal tax rate would reduce inequality, there are counterarguments to this notion. For example, Heathcote et al. (2017), state that a higher tax progressivity in the USA would lead to a reduction in labour for higher educational skilled workers causing a shortage in the supply of high education labour. As such, the shortage in the labour market would increase labour income causing an off-setting effect on the envisioned redistribution effect of the increased tax rate. Moreover, it would also potentially reduce the investment in human capital as the return rate has been decreased by increased tax rates. However, they do mention that this is a specific effect which would come into effect within the USA. They state these negative effects are a predominant factor in a capital-intensive economy (of which the USA is one of the few within the OECD countries). Moreover, they also acknowledge that their model is missing the effect of improved investment possibilities for low-income because of redistribution. As such, the exact consequence of increased marginal tax rates (and alterations within the tax system) are complex and dependent on the country's economy, and the assumptions made are critical for the outcome. I will not attempt to bring a definitive conclusion on its effect but want to warrant that the simplistic vision that tax rates only alter tax revenue is short sighted and one should acknowledge that it significantly influences complete economies.

### Wealth tax

The second tax to be discussed is the wealth tax which taxes wealth in various forms, e.g., property, real estate, and assets. First, some general aspects of wealth tax will be reviewed after which potential adaptions to the wealth tax are proposed, and close with a review of wealth transfers.

At first, the general characteristic of a wealth tax is that it can be reviewed as a tax on the normal return rate of wealth (Scheuer & Slemrod, 2021). As such, wealth tax is correlated to tax on income from capital by the formula

$$\frac{Wealth\ tax}{Return\ rate} = Tax\ on\ income\ from\ capital$$

For example, if an asset has an 8% return on capital and a 4% wealth tax rate is imposed, then this is equivalent to a 50% tax rate on income from capital, i.e., 4%/8%. However, if the return rate would be 12%, then the equivalent tax on income from capital would have been 33%, i.e, 4%/12%. This feature is of large importance as it causes that a wealth tax will not compensate for under or overperformance of an asset but considers an average return rate which it taxes. Thus, if the recipient is obtaining higher return rates, then they will incur lower equivalent tax on income from capital or vice versa. This characteristic of being a tax on the normal return rate will return more frequently in the upcoming discussion.

While a wealth tax functions as a wealth income tax on the normal return rate, there are important differences between a wealth tax and an actual wealth income tax, even though they are sometimes used interchangeably. The OECD (2018) provides the following three key differences: 1. Wealth tax can also tax assets which do not have an (annual) return rate. For example, art and real estate do not create annual capital income (wealth is only generated when sold) and thus would not be taxed when applying a wealth income tax, 2. Wealth tax is less prone to cause a "lock-in" effect of assets which generate wealth via wealth gains as opposed to a wealth income tax. This is caused by the fact the general notion that taxes cause a disincentive for the taxed good or service. Thus, a wealth income tax disincentives creating income from wealth (which occurs when selling of wealth assets). This is opposed to a wealth tax, that disincentivizes having wealth, and 3. Wealth tax is in potential more stable than a wealth income tax as the latter can be more heavily dependent on the up and downswings of the economy.

Moreover, it is important to realize that a wealth tax is a broad term and various aspects are to be considered when discussing it. For example, within the Mirrlees Review (Mirrlees, et al., 2011), they state that there are four aspects which are vital to be aware of: 1. Differentiating between a Life-Cycle taxation and an annual taxation, 2. Discerning private wealth and corporate wealth (which can be a difficult distinction, especially for privately owned corporations), 3. Potential to influence the investment opportunities and allocation of wealth, and 4. Potential for consumption smoothening during non-income periods, i.e., periods of unemployment and retirement.

I will not review these aspects separately as it would be diving into too much depth, but when opting for a wealth tax then opinions should be formed revolving around these matters. For example, in regard to the fourth issue, it could be questioned if the government is responsible to safeguard people from making "wrong" decisions. This is an issue because there is a correlation between (low) education level, (low) income, and (short) planning horizon. This cocktail causes that these people are not making founded retirement plans which could cause impoverishment during their pension. As such, it can happen that the few who are unable to create a sufficient retirement plan can cause that the government will create a retirement system for the complete society (Mirrlees, et al., 2011).

In general, there are various pros and cons to wealth taxation and economists are divided on whether wealth taxes are a viable option within the tax system (Adam & Miller, 2021). When discussing these aspects, only recurrent (annual) wealth taxes will be

discussed and refrain from inspecting the one-off wealth tax.[11] The reason for doing so is that a one-off wealth tax would not be judged as a policy which could be implemented due to ethical issues and its inability to give supply a durable solution to inequality as it could correct inequalities only once. The following arguments favouring and opposing the implementation of a wealth tax are based upon the arguments provided in the review of Adam & Milers (2021).

### *Arguments favouring a wealth tax*

**1. Wealth possesses unperformed consumption and, as such, a loss for society**

As first formulated by Allais (1977), wealth taxation has the characteristics of "use-it-or-lose-it" which penalizes not spending wealth in present times. According to Guvenen et al. (2019), the wealth tax promotes present-time consumption and/or investment which enhances productivity. This argument somewhat echoes with the example of Fisher et al. (2020) showing that an income transfer from rich to poor would increase demand as the propensity to consume is larger for lower-income deciles (for further detail please go to section 1.4 and read Consumption). However, attempting to copy this narrative 1-on-1 for wealth can be a bit of a short corner as income concerns annual gains while wealth involves the optimization of Life-Cycle spending.

Regretfully, the literature on the effect of wealth tax on economic growth is limited, as also stated by Hansson (2010) in one of the rare articles considering this topic. His findings were that wealth tax could potentially be causing negative economic growth, i.e., for every 1% wealth tax causing minus 0.02-0.04% economic growth. However, as stated by himself, the data is severely limited and depending on data inclusion/exclusion can also become (insignificantly) positive correlating. I will leave the discussion at this point but will state that the effect potentially is limited and will most probably be highly dependent on how it is implemented in relation to the whole tax system.

**2. Taxing the able instead of the unable**

There are several indications that income and wealth are correlated with each other with increasing correlation at the ends of the distribution, i.e. low and high-income populations are also those with low and high wealth respectively (Durand & Murtin, 2015), as shown in Figure 84. Not only do income and wealth correlate, but there is also a positive correlation between income inequality and wealth inequality. This would suggest that a wealth tax would target those with high incomes and becomes more effective when applied in countries with higher economic inequalities. While wealth tax can cause redistribution, it has to be designed properly (Summers, 2021). It would be beneficial to have an alternative minimum tax (AMT) which sets a high cut-off for the relieved wealth tax base. This cut-off should be set at the point after which top income/ wealth is disproportionately able to safeguard their income (and wealth) from being taxed. As such, the added wealth tax enables taxing the missing income from the other evaded taxes. This could be optimized by considering paid income tax which would avoid taking those who pay their taxes fairly. However, such tax designs can be difficult to apply due to requiring multiple databases to create appropriate tags and, therefore, can be costly (Summers, 2021).

[11] A one-off wealth tax is an unexpected once in a lifetime wealth tax designed to correct failures or grant (large) revenue stream in periods of great need (Adam & Miller, 2021)

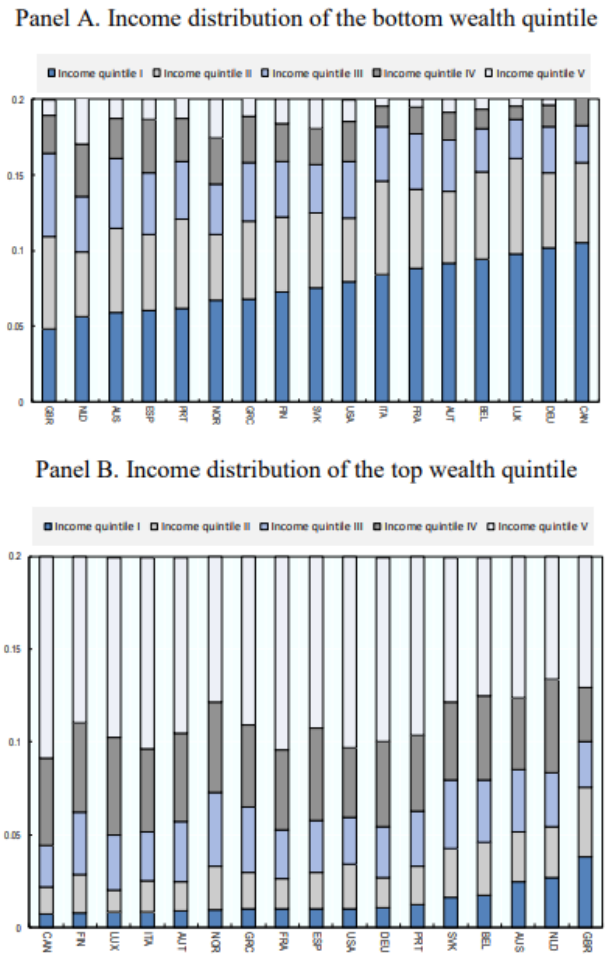


**Figure 84 The relative contribution of an income quintile to panel A) bottom wealth quintile, and panel B) top wealth quintile for various OECD countries.** *Note: Countries are ranked ascendingly according to the relative contribution of the first income quintile. In the top panel, the fourth income quintile for Canada represents the fourth + fifth quintile as they were not reported separately. The results are based upon data from the OECD Wealth Distribution Database and the OECD Income Distribution Database. This figure has been obtained from* **(OECD, 2018)**

A similar proposal has been put forth by others, such as Saez & Zucman (2019), which propose a wealth tax for only the top wealth owners. They state that the top can escape income tax due to their income characteristics, i.e., mainly dependent on capital income. Using a wealth tax for that specific group could decrease the wealth inequality when enforced aptly. This effect in reduced wealth inequality caused by wealth taxes can (also) be explained by the intertemporal elasticity of substitution. This parameter measures the propensity to hold wealth for future expenses. As the rich have higher elasticities, they respond more heavily to imposed wealth taxes causing a (proportionally) larger decrease in their wealth when compared to the poor (Guvenen F. , 2006).

An important remark to the wealth, and the potential necessity of a cut-off value, is caused by the existence of the rich "Hand-to-Mouth" individuals, i.e., those who have considerable wealth but a high propensity to consume (as explained in section 1.4 Economy under Consumption). The individuals have their wealth "locked-in" into illiquid assets (mostly real estate) and are unable to alter their wealth considerably in response

to a wealth tax. As such, they would incur tax but their (already) limited disposable income would be pressured even more. One can attempt to circumvent these issues by exempting real estate, but this would have three negative effects: 1. favour the rich with considerable income (they would incur no tax but would have the means to do so), 2. create a more complex tax system which needs to consider exemptions (and create appropriate measurement techniques), and 3. create biases in the type of wealth assets owned.

**3. Wealth is not without value**

There are indications that large stock of wealth correlates with socioeconomic power and functions as a mediator in social relations. Furthermore, wealth enables the ability to ignore opportunities of venturing into labour acquisition in contrast to those who need to acquire employment to support their livelihood (Shaikh, 2016). When going to the extreme, the capitalist could live from the interest of its capital not needing to perform labour, i.e., a rentier, while the labourer consistently needs to perform labour and in essence becomes a "working slave". As such, Shaikh (2016) describes the existential function of wealth to give flexibility to the owner to make life decisions which contributes to the value of the wealth beyond its currency value.

Hansen & Toft (2021)describe a similar occurrence of added value to wealth through wealth-based opportunity hoarding. From the analysis of Scandinavian countries, they find class-origin gaps are correlating with wealth over the past decades and have enabled socioeconomic advantages to perpetuate over the generations. They state that class-origin differences were dominated by the income & education perspective in the past, but recent developments are steering the narrative towards wealth & market governance. This could be seen as problematic from an opportunity perspective as the class-origin differences caused by income can be explained as the effectiveness to reproduce advantages via education while wealth-dependent differences can be explained as the effectiveness to reproduce advantages through families (Bourdieu, 1998). As such, it seems that family origin is becoming more important than education which creates a more closed society (in regard to opportunity chances). However, the critical note is that there are some difficulties to explain why these correlations are existing. Potentially this could not be caused by the wealth but by the indirectly related access to social networks, ease of financial risk-taking, ability to use debt as an investment method, access to selective management services, and wealth transfers (Hansen & Toft, 2021). As such, it is not clear whether creating wealth equality will alleviate the opportunity differences.

### *Arguments opposing a wealth tax*

**1. Alternative ways of taxing**

Questions can be raised if wealth tax is the most efficient manner to achieve one's goal. Presumably, the costs to administer wealth tax are relatively much larger when compared to the average cost of taxation. For example, Burgherr (2021) shows that the wealth tax costs 15% of the generated revenue while the average tax administration costs are 0.52% of the total generated revenue. Moreover, as will be mentioned in the fourth argument, the goal of wealth taxation should be novel compared to the goals of other types of taxation to avoid double taxation. As of yet, according to Adam & Miller (2021), there are no apparent novel goals and therefore one should prefer improving other taxes instead of implementing a new type of tax with a similar goal.

### 2. Complexity of wealth tax due to numerous types of assets

In general, it is stated that measuring wealth is much more complex than measuring wealth and requires a more complex administration and comes with higher costs (Brown R. A., 1991). In part, Brown (1991) explains that this is caused by the fact that income involves a transfer which causes the necessity to assign value to a transfer which can subsequentially be taxed. This is in contrast to wealth which is owned without being assigned a certain value by a third party. Thus, the value has to be settled upon between the taxpayer and tax receiver which becomes difficult and (potentially) subjective. This is certainly the case as the current tax report systems involve a self-reported system when filing taxes (OECD, 2018).

The complexity of proper wealth taxes is rather abundant. For example, the Wealth Tax Commission (Troup, Barnett, & Bullock, 2020) stated that adaptation caused by the tax reforms, i.e., specifically IR35, made the tax administration excessively complex and caused a non-compliance rate of 90%. This is also highlighted by their finding that the tax administration requires often more than 12 months, with 2-5 years being common, to evaluate estates before being able to comply with the inheritance tax. They require to valuate every asset, ascertain (full) ownership, review the past 7 (and sometimes 14) years for anti-avoidance procedures, and account for every relief & exemption and interactions between those rules. This is by no means a strange phenomenon, for example in the Netherlands "easy" cases can already take up to 1 year (AllesOverErven.nl, sd) and in the USA the "easy" cases are judged to take 6 months but also several years for a settlement is not being uncommon (Carter & Mast, sd). Rather obviously, inheritance taxes are different from annual wealth taxes as they are a one-off wealth tax applied on wealth transfer. However, the severe complexity of evaluating wealth puts doubts about the ability to evaluate assets for annual taxation.

### 3. Taxation on capital is taxation on future consumption and not on current consumption

An important aspect of wealth is that it is the accumulation of income which has not been spent but will be spent at a future point in time. In the perspective of intertemporal decision-making, wealth is accumulated at such a level that the gains of the utility function of future consumption are equal to the gains of the utility function of present consumption (Malinvaud, 2008). As a wealth tax impacts the wealth accumulation process, it influences the utility gained from wealth in the future causing a shift from future to present spending.

In the matter of evaluating future and present spending, one can notice a difference between the rich and the poor (Bliss, 2018). The core issue is that the poor are not able to discriminate in consumption between the present and the future because they do not have enough funds to meet the required consumption in the present. As such, only the people who have funds beyond the necessary consumption can accumulate flexible wealth, i.e., the liberty to alter expenses between the present and the future. As such, only those with an income higher than the required expenses can change the size of their wealth to be efficient with wealth taxes on their decision-making of asset allocation (Bliss, 2018).

However, the fact that the rich are more able to gain wealth also has an important implication for the purpose of the wealth owned which can be explained by using the

Stone-Gary utility function (Achury, Hubar, & Koulovatianos, 2012). This function explains that an item only gives added value after a certain amount of the item has been accumulated. In terms of savings, this is explained as a minimum amount of wealth required to accommodate sudden expenses, after which wealth can be used as an investment tool. This notion of initial (small) wealth sizes being used for sudden expenses causes that it is of importance for the social security to people. As such, people who only have social security wealth, and no excess wealth, would incur a larger impact of a wealth tax. Moreover, as the wealth is being used for social security, the ability to convert it to other means is limited while rich people have the ability to convert it into non-taxable assets.

#### 4. Tax inefficient due to double taxation and compounding interest

It is difficult to state whether wealth tax should be considered a double taxation. Summers (2021) states this would be a matter of perspective whether the applied taxes have the same goal. As an example, there should be no relief for income tax when it is also subjected to the tobacco tax as they have different goals. However, if wealth tax is reviewed as an opportunity to cause redistribution, then one could state it to be a form of double tax as income tax already has that particular goal (partly). Then again, if the wealth tax would be positioned as an incentive to promote present consumption in favour of future consumption, then it could be perceived as a viable tax as it has a "new" goal. As such, whether double taxation would be a double tax is a matter of perspective and chosen narrative.

Moreover, a vital notion to be able to claim double taxation is that the taxed based assets also have incurred taxes twice. While this seems to be an obvious notion, there are notable differences between the poor and the rich. Wealth owned by the poor is (mostly) gained from labour income, which experiences effective taxing. However, the wealth owned by the rich has a considerable part coming from capital income which experiences only limited forms of taxation caused by the various exemptions and untaxed base for capital income (OECD, 2018). Moreover, as also described earlier in section 2.1 under Tax data, the rich have increased capabilities of tax evasion and avoidance which decreases the amount of tax experienced on their wealth (Alstadsaeter, Johannesen, & Zucman, 2018). In general, these occurrences are possible due to the complexity of the tax system, i.e., the various exemptions and reliefs, which combined with a narrow capital tax base cause large opportunities for avoidance and evasion (OECD, 2018). As such, double taxation would be more of an argument to limit wealth tax on the poor in contrast to the rich.

Besides, the previous issues, there is also the problem of inflated marginal effective tax rates caused by the combination of wealth tax and tax on wealth income (OECD, 2018). Examples have been shown for France and Spain where the tax rate exceeded 100%, effectively not only removing income from wealth but also diminishing the size of the wealth base, as shown in Figure 85. As such, it would be disadvantageous to have savings as one would lose wealth. Thus, a wealth tax would require an evaluation from the perspective of the total system to be able to perceive the marginal effective tax rate. While this is not impossible, it does mean a more complex tax system which potentially needs exemptions and reliefs.

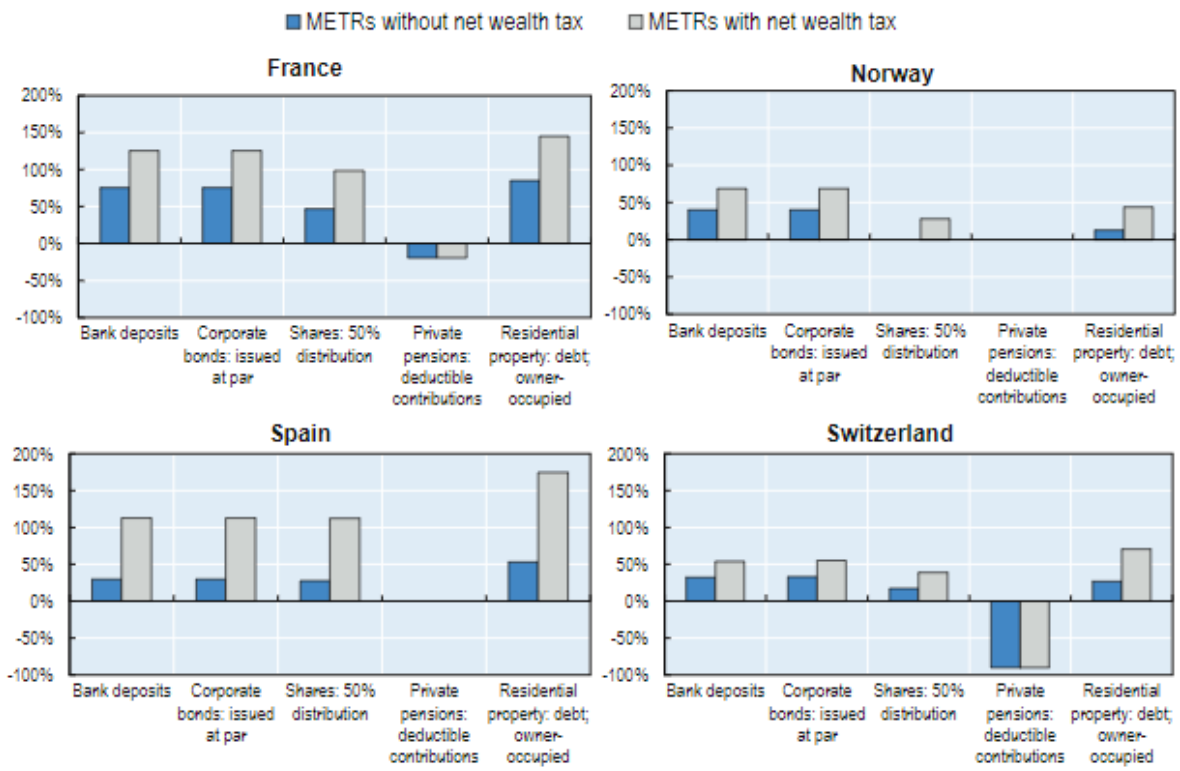


**Figure 85 The marginal effective tax rates with and with wealth tax on various assets.** *Note: The marginal effective tax rate has been based upon tax rules present on the 1st of July. The results are based upon data from the OECD Taxation of Household Savings. This figure has been obtained from* **(OECD, 2018)**

Another problematic nature of wealth taxation is its (annual) recurrence. For example, the difference between a 1% and 2% annual tax rate over an asset for 40 years (with a return rate of 5%), causes a difference of, respectively, almost a third or half of what could have been earned without a capital tax (2021). Considering the large impact, it could be questioned if such a penalty for future consumption is desired. This also causes the negative effect that investors are promoted to favour risky investments with higher (potential) returns in an attempt to obtain returns above the normal return tax rate. The investments in more risk full assets steer the economy to instability with more pronounced up and downswings (Perret, 2021).

### *Wealth tax's verdict*

The general statement is that wealth taxation is not preferred and should be regarded as inferior to income, excess return rates, gifts & bequests, and consumption taxation. However, as tax systems are often imperfect, it can have added value to compensate for flaws occurring within the system (Adam & Miller, 2021). Also, the OECD (2018) supports this narrative of non-preference for wealth taxes. It is the inability to properly measure certain parameters which can make wealth taxation useful. Moreover, there is a preference for diversification of imperfect taxations in favour of one larger imperfect tax (OECD, 2018; Adam & Miller, 2021). Potentially, in the future, when statistics and measurements are improved, the necessity to use wealth tax can disappear due to improvements made in the tax scheme of other taxes (Adam & Miller, 2021).

The fact that wealth tax is not a preferred tax type is also exemplified by the fact that in 2017 only four OECD countries were levying a wealth tax on overall wealth stock,

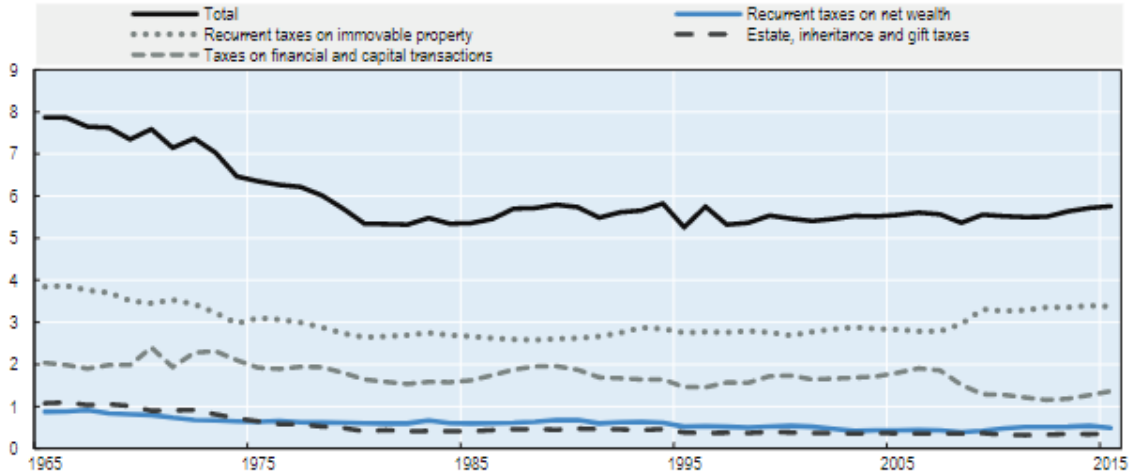


**Figure 86 Historic evolution of the average capital-related taxes for OECD countries.** *Note: Results are based on OECD Revenue Statistics Database. This figure has been obtained from* **(OECD, 2018)**

i.e., France, Norway, Spain, and Switzerland (OECD, 2018). This is in contrast to the popularity of recurrent taxes on immovable property which is levied in every OECD country and taxes on financial and capital transactions in most of them and generating a noteworthy size of tax revenue, as shown in Figure 86. The OECD (2018) concludes that this is caused by the low revenues which were generated (accounting for 0.5-3.7% of total tax revenue), the high administrative costs, the flexibility of global (fiscal) wealth transfer for tax avoidance, and the low redistributive impact of the tax. Moreover, the current narrow tax base of wealth taxes, i.e., exclusion of financial assets (owned by the rich) and inclusion of immovable assets (owned by the many), severely limits the progressive abilities of the wealth tax (OECD, 2018). From a redistributive perspective, the current implemented versions of wealth taxes are therefore unfavourable.

### *Opting for a change*

To bring change in the wealth-related taxes, Mirrlees et al. (2011) bring forth the notion to make a distinction between normal and excessive interest. Normal interest is defined as the interest required to retain the same value of the wealth, whereas excessive rent is defined as the interest gained which causes an increase in the value of the wealth. Using this distinction, they argue that normal interest should not be taxed as one should be allowed to retain a stable amount of wealth, whereas excessive rent should be viewed as income and be added to the income from labour. The reason for doing so is that excessive rent and income from labour bring forth the same amount of consumption capabilities (Mirrlees, et al., 2011). Figuratively, 100 euros gained from capital gives the same opportunities in the consumption market as 100 euros gained from labour. As such, discriminating between these two types of income would be arbitrary and, even more so, would create unnecessary complexity in the tax system.

According to Adam & Miller (2021), the advantage of only taxing excessive returns is that it does not distort the economy. They reason that having wealth is not being penalized, but only the amount of profit earned on the capital is impacted. When the tax rate is equal between assets, this would also not induce a preference for one asset over another asset. Decisions would then primarily be based upon risk aversion. Also, if the

excessive tax rate would be equal to the labour tax rate, then information concealment is being reduced as advantages of concealment are negated.

Using the distinction between normal and excessive rent, Mirrlees Review (2011) provide three tax scheme which could achieve wealth-related neutral tax systems. In their analysis of the UK, they state that these three options can all play a pivotal role in the tax system and should be applied in different situations.

1. **The cash flow expenditure system**

This scheme considers levying tax on withdrawal/expenditure of wealth and can play a pivotal role in the pension system. The idea is that investments can be made with no or limited (tax) limitation to incentivize investments for pensions. However, to avoid that such investments are foregone from taxes, there should be regulations regarding withdrawal (having an age restriction and (annual) size restriction) to ensure the guided goal of income in later life.

However, one should account for various issues to avoid tax avoidance & evasion. First, there are various pension systems with different investment (taxation) rules for employers and employees. When transitioning to a new system, one would need to account for this difference and avoid specific populations being proportionally more disadvantaged. Secondly, there are (sometimes) exemption rules for a one-time withdrawal without being taxed. This would effectively mean that a portion of the withdrawal is untaxed through income or consumption tax, which would benefit the people who experience higher marginal tax rates, i.e., the rich people. Preferably these exemptions are removed, or coherent taxes are applied. Thirdly, complicating the system is that the annual investment into the pension is size restricted, i.e., only a certain amount of investment is tax exempted, after which income tax needs to be paid. This creates a differentiation between present and future consumption which potentially is unwanted. Fourthly, tax rules should be universal and tightly regulated. For example, if the entity can invest tax-free into the fund, then it should be avoided that the entity can travel to a location where wealth can be withdrawn from the fund without taxation as this would create an untaxed wealth base. As such, potentially international regulations should be applied.

2. **Taxing income, not wealth**

To simplify matters, it is advocated to tax income and not wealth. This is in part to avoid distortion of consumption inter-temporally. This would steer away from taxing wealth, especially those with low interests such as bank savings and building society accounts. They reason that these types of assets are not having excessive returns and, as such, do not need to be taxed on the return rate.

3. **The rate-of-return allowance**

This type of tax considers the excessive returns which are occurring among (financial) assets such as stock options. These types of assets can generate larger return rates and provide considerable income revenue. These types of returns should be taxed at a similar rate as labour income. A large reason to favour these types of taxes is caused by the fact that in the current system large incentives are made to convert labour income into capital income (disguising it as corporate income) to gain favourable tax rulings. As

the ability to do so is large for the rich than for the poor, these transformations are non-neutral.

However, the rate-of-return allowance system should, in the light of neutrality, also compensate when the rate of return is below the normal return rate to avoid non-neutrality between risky assets and safe assets. Without going into too much depth, they envision the ability to offset such losses by either averaging over the years or compensating by labour taxes, or off-set the loss of one asset over the gain from another asset. Overall, Mirrlees et al. (2011) consider the rate-of-return allowance system to be the easiest to be implemented and the highest odds of being accepted politically.

### *The unique position of wealth transfer*

When considering wealth taxes, it is often reviewed in its correlation to wealth inequality. However, within the domain of wealth inequality, wealth transfers play a pivotal role in transporting wealth between generations and aid in wealth inequality. When attempting to tax wealth transfers, the complexity of the assessed assets and exemptions combined with negative public opinion prove to be a large issue. Overall, this has caused that wealth transfers are beneficial to the so-called "healthy, wealthy, and well-advised" (Mirrlees, et al., 2011). This has been counterproductive to the desire to bring equality of opportunity, as wealth transfers seem to be effective in propagating advantages over sanguine lines, as stated earlier in section 3.3 Opportunity inequality. As such, there seems to be a base for a wealth transfer tax, as famously put forward by John Stuart Mill:

> *"I see nothing objectionable in fixing a limit to what anyone may acquire by mere favour of others, without any exercise of his faculties, and in requiring that if he desires any further accession of fortune, he shall work for it"* - Mill (1848, p. 267)

However, the OECD (2021) showed that public support for inheritance tax is low as it is perceived as being double taxation (with a negative connotation of it being a "death tax") and having its impact being misperceived. At first, the size of people being taxed is highly overestimated. For example, in the US it was believed that >50% of the people were being taxed but only 0,1% are rightly so. Secondly, the tax rate has also been largely overestimated. For example, in France, it was believed that spouses experienced a 22% taxation rate while they were actually being exempted from taxation. Also, the progressivity of the taxation scheme was heavily overestimated believing that the lowest marginal rate was 20% while it was 5%. Thirdly, there has been a misconception about the number of assets which are being taxed. For example, yet again in France, on average 4-7% of all assets were being taxed while the majority believed that this would be >10%. Overall, the knowledge about inheritance tax is limited (potentially due to its complexity) which causes unjust resentment towards the taxation scheme overall (OECD, 2021).

Nonetheless, the OECD concludes that increased taxation upon inheritance would be an effective policy to curb increasing wealth inequalities (OECD, 2021). This would be the most efficient when combined with a moderate, income taxation policy. To promote acceptance by the population it would be beneficial to rephrase inheritance taxation as a type of income taxation and it should be perceived to be motivated as creating more

(opportunity) equality. It is deemed probable that higher awareness of the inequality of inheritance could cause higher empathy for a change in taxation scheme (OECD, 2021). However, Mirrlees Review (Mirrlees, et al., 2011) states that there are certainly various inconsistencies which limit the functionality of inheritance tax. As such, they recommend the following improvements:

1. **Include both in vivo[12] and inheritance transfers**

Currently, often in vivo transfers are not taken into consideration due to measurement issues by the agent as these transfers are self-declared. However, in the likes of life-cycle income, and the related equality of opportunity, it would be deemed to be desired to tax all forms of wealth transfers. As mentioned earlier, in vivo wealth transfers are potentially more capable of altering opportunity chances than inheritance. As such, ignoring these transfers will be unwanted. Moreover, not taxing in vivo transfers would cause a favouring for these types of transfers. However, as in vivo transfers are not accessible to all parts of the population, i.e., it would require redundant funds which are mainly accessible to the top portion of the wealth distribution, it would cause non-neutrality within the system. As of yet, the current research toward effectively taxing in vivo gifts (from the recipient side) has been extremely limited. As such, research is in the dark about the potential it can have as an effective tax system.

2. **Levied at the acceptor side**

Wealth transfers represent the transfer of unconsumed income and are avoiding consumption tax. To correct this issue, it is required to levy tax on the transfer, but it is unclear whether this should be done by the donator or the acceptor of the transfer. This matter of perspective also frequently dictates the perspective on taxation. Reviewed from the donator, the usual argument is that he/she has the right to spend the wealth as he/she pleases and, as such, no penalty should be incurred on the transfer. Being taxed upon the transfer would therefore constitute a limitation on this freedom and can be perceived as double taxation, i.e., it has already been taxed through income tax. Moreover, it could be perceived as an incentive to spend all earned wealth as else it would be "thrown away" to the government via tax.

However, when reviewed from the acceptor's perspective, the usual argument is that the transfer is an unexpected bonus to his wealth and therefore can be taxed as income. Moreover, it has been stated that by promoting wealth transfers through tax exemptions the donor is promoted to transfer wealth and the acceptor will account for this as a type of income. This could create the Carnegie effect which is named after Andrew Carnegie:

> *"The parent who leaves his son enormous wealth generally deadens the talents and energies of the son, and tempts him to lead a less useful and less worthy life than he otherwise would."* - Carnegie (1891/1962, p. 56)

[12] In the Mirrlees Review (2011) they refer to in vivo transfers as inter vivo transfers. The difference is small (without a true practical implication for this thesis), where inter vivo states being a transfer between living people, whereas in vivo transfer refers to a transfer of a living person to another entity which could also be fduns, charity, and other fiscal entities which can receive wealth without being an actual person. To be consistent I will use the term in vivo transfers as it is a slightly broader term.

Overall, Mirrlees et al. (2011) put forth that the transferred wealth accepted by the acceptor does not experience a difference when wealth is gained from one donor or a multitude. For example, from an acceptor's perspective, receiving 500.000 euros from one parent would effectively be the same as obtaining 100.000 euros from five different family members. As redistribution is interested in the outcome of transfers, one would advocate levying the tax on the recipient side as this would allow accounting for multiple wealth donors. Moreover, such a policy would also create the opportunity to review donations over the whole lifecycle and give the potential to tax the total amount of wealth received in life instead of its annual contribution. This would also allow avoiding high tax rates in the year when taxes are being received and average the tax base over one's total life span. However, measuring lifecycle donations is difficult as it would require an extensive database and tracking of all wealth received during life.

### 3. Broad to avoid influencing decision making

Currently, there are various exemptions and reduced tax rates during inheritance. For example, capital gains are foregone at death which favours having assets in the form of capital gains (as tax is being circumvented). This type of forgiveness is highly distortionary as it incentivizes the asset owner to avoid selling the asset (as favourable taxation is just around the corner) while potentially other assets are more favourable creating economic inefficiency. An important problem with inheritance taxation schemes is the interaction with business equity (OECD, 2021). Mostly business equity is being (largely) exempted from taxation schemes to ensure continuity of businesses. However, the performance of businesses after inheritance mostly underperforms and the generosity of the tax exemption is too large. Reinvestigation and more stringent conditions towards these types of inheritance are wanted as they are highly advantageous to the wealthiest of people within societies and are detrimental to wealth redistribution.

In general, it is unwanted to create distinction in the source of the wealth transmitted, being either coming in the form of business equity, trusts fund, foundations, or other types of wealth, they all represent a form of newly acquired wealth from the recipient perspective and should be treated similarly. Creating difference causes options for (wealthy) owners to abuse the system the artificially reduce the taxation. In essence, the tax rate should be based upon the recipient side creating a distinction between life cycle transfers or annual transfers, or being received by an individual, profit entity, or non-profit entity (OECD, 2021).

I will not be able to close the chapter on how the wealth transfer tax system should be designed. The problems are veiled by complex arguments and create subjectivity to the desired policy, as exemplified by the statement of the European Commission (2016)

> *"Economic theory provides arguments in support of taxation of inheritances, but the precise policy prescriptions are not clear."* – A. Iara (European Commission, 2016, p. 15)

As such, the topic will not be discussed in further depth, but the general statement is made that it could be favourable to implement (and increase) wealth transfer taxes. However, the full design is yet to be further researched and most probably will be

influenced by the tax system in different nations. However, in line with Mirrlees et al. (2011), the design should avoid loopholes and attempt to be neutral.

### Consumption tax

Consumption tax is an indirect tax which differs from direct taxes such as income & wealth-related taxes, as explained earlier in the section 'General construct'. The consumption tax can be differentiated into two forms, i.e., the VAT and excise taxes. This differentiation is done based upon the fact that with the VAT the final consumer holds the statutory burden while for excise taxes this is the producer. However, producers can raise the prices of their goods and services such that the economic burden of the excise tax is transferred to the consumer (Ortiz-Ospina & Roser, 2016). For this thesis, the analysis will be simplified by only reviewing the effects of consumption tax on economic inequality of individuals and not on the effects on producers as the latter would fall outside of the scope of the thesis. However, it is to be noted that the following narrative will also hold for excise taxes which have their economic burden transferred to the consumer.

One of the largest reasons to discuss the VAT is that it is levied in 170 countries and on average has been contributing to almost 1/3rd of the tax revenue stream (OECD, 2020). However, this has not always been the case, in the early 60s only a few countries levied VAT, as shown in Figure 87. The increased usage of the VAT is foremostly caused by the decreasing import taxes which occurred due to trade liberalization and required a compensating tax revenue stream. Next to the more frequent implementation, also the VAT rate has (on average) steadily been increasing, as shown in Figure 88.

However, as always, these are general statements and stark differences can be seen between countries. For example, the USA generates just over 10% of its revenue stream via VAT while Chili is hovering around 40%, as shown in Figure 89. As noted earlier, these differences can (partly) be explained by differences in the tax system design where (in general) developing countries are more dependent on the VAT while the developed countries lean towards income tax.

In the light of this thesis, i.e., economic inequality, the importance of the VAT is questionable as its ability to cause redistribution is questionable as the tax base is not (directly) related to income or wealth. Literature has not reached its conclusion on whether consumption taxes are regressive, neutral, or progressive. As described by Thomas (2021), this is in part a consequence of which entity is being compared to the VAT,

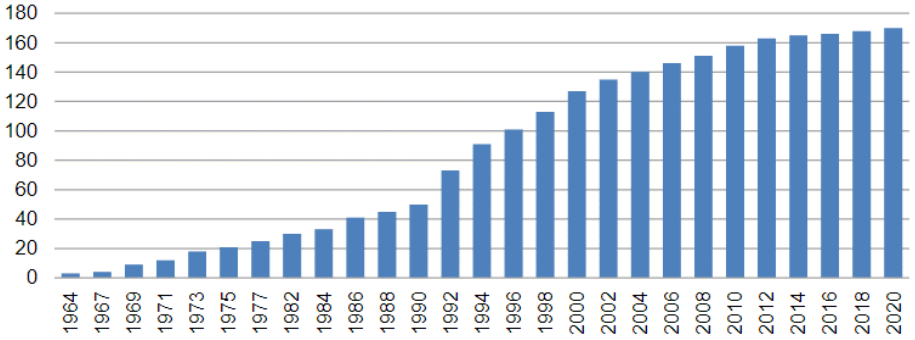


**Figure 87 Number of countries with VAT between 1960-2020.** *Note: The author's results are based upon the works of Annacondia* **(2019)**. *This figure has been obtained from* **(OECD, 2020)**

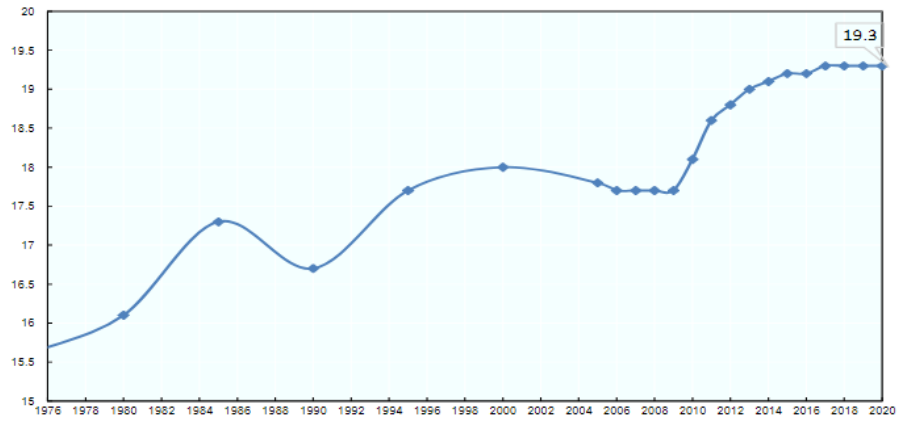


**Figure 88 The evolutions of the VAT rates as an average of the OECD countries between 1976-2020.** *Note: The author's results are based on their own calculations. This figure has been obtained from* **(OECD, 2020)**

as shown in Figure 90. When compared to income, the VAT is regressive in nature, while when compared to expenditure, it is proportional or slightly progressive. As the nature is dependent on the comparative entity, one can question what the "true" answer is.

Thomas (2021) states that a tax should be valued on its targeted design. Because the VAT is targeted at consumption, i.e., expenditure, it should be reviewed from such a perspective. He also argues that comparing VAT to income would create the difficulty that income is not directly spent. As such, income retained today can be expended in a later Life Cycle stage. To assess the nature of the VAT compared to income a life cycle analysis would be required, but this has not been done yet due to the complexity of obtaining quality data. However, there can be some truth in the regressive nature compared to income because higher incomes have higher capabilities to transfer wealth to offspring (which is only marginally taxed) and as such circumvent the VAT which is not available to the less wealthy individuals.

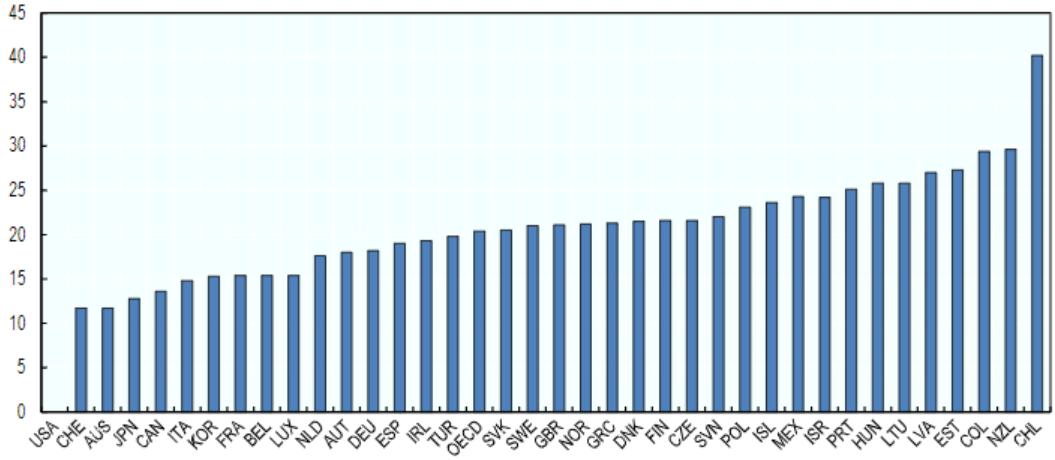


**Figure 89 The relative contribution to the total tax revenues per country in 2018.** *Note: The author's results are based upon an adaptation of the Revenue Statistics 2020 published by the OECD. This figure has been obtained from* **(OECD, 2020)**

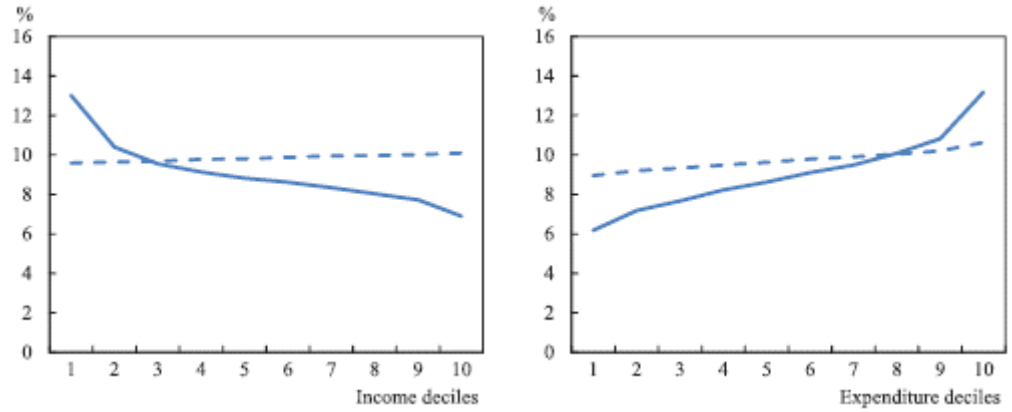


**Figure 90 The average VAT burden for households according to left panel) income deciles or, rights panel) expenditure deciles.** *Note: Solid line indicates VAT/income and the dashed line indicates VAT/expenditure. This figure has been obtained from* **(Thomas, 2021)**

### *Improving the VAT*

As the redistributive capabilities are potentially limited, it would prove to be more worthwhile to review the VAT on its intended design, i.e., to tax the benefits gained from the consumption (Mirrlees, et al., 2011). When desiring other goals, such as redistribution, it is advised to use the taxes which have their intended design focused on that particular goal, e.g., reviewing income tax for redistribution. Therefore, Mirrlees et al. (2011) state that real estate and financial assets should be excluded from consumption tax as it taxes transactions instead of consumption. They argue that taxing transactions penalizes trading, i.e., attempts to optimize welfare between the parties, for which they find no economic justification to punish more frequent sales than infrequent ones. Even more so, it could cause that those items are being held for a longer period than deemed wanted.

As examples of how taxes should be designed, Mirrlees et al. (2011) state that it would be better to tax real estate based upon the benefit it gives, i.e., the benefit of living in a particular location, and should therefore be taxed as residency tax. As for financial assets, the benefits are gained from obtaining income and, therefore, the income from the asset should be taxed. In essence, they state that transaction taxes have limited economic logic. This is part of the optimal taxation theory which demands that disruption of the economy should be minimized. This should occur by minimizing the influence on the market, i.e., there should be no taxation between firm transactions, and taxation should only occur on end products.

Another conclusion of the Mirrlees Review (2011) is the preference for simplicity by implementing uniform VAT rates. In their reasoning, varying VAT rates for different products create unwanted complexity. This would create advantages in the political arena where different stakeholders will attempt to lobby for favourable tax rates if differences are present. This creates pressure for the political system to explain why certain commodities have a preferable tax rate over other commodities. In their report, they narrate the comical example where a certain product, Jaffa Cakes, needed a court ruling to be typed as either a biscuit or a cake. The cause for this was that cholate topped biscuits were subjected to VAT while chocolate topped cakes were not. The producer brought a stale example to court and stated that cakes go hard while biscuits go soft. As their product went hard it should be regarded as a cake (and the judge favoured their appeal). While only being an example, it shows the difficulty for the tax administration to create

a “sane” system and adequate ruling which becomes more complex with every exemption and differentiation. As such, the tax system becomes agile by simplicity and enables them to perform their tasks more efficiently.

However, there are some arguments to differentiate VAT rates between products, but these are often weak and do not compel as ground-breaking arguments to steer away from uniform VAT rates (Mirrlees, et al., 2011). The only strong argument is when commodities cause spillover effects, i.e., externalities which cause extra benefits or damage to society which is not (automatically) incorporated into the price of the commodity. The prime examples are alcohol, tobacco, and fuel, which all have negative consequences, either on personal health and/or the environment. As such, the difference in tax attempts to promote or discourage certain behaviour. There seems to be a base to cause such differentiation but implementing these types of taxes can be difficult. For example, a sugar tax should discourage excessive consumption of sugars but due to the widespread of sugar in both healthy and unhealthy food products, it is difficult to cause to wanted behavioural change through a sugar tax. It would require many exemptions to products, being potentially some arbitrary as the previous cake example, and create higher complexity to the system. In such a sense, it could be more favourable to have policies outside the tax system arena which can be more efficient in achieving the wanted goal, e.g., forbidding added sugars to food products, instead of creating a complex consumption tax system.

The overall conclusion of consumption taxes is that it should primarily be seen as a possibility to collect tax revenue neutrally. As such, this would encourage making the system broad and uniform with minimal exemptions. The potential exemptions which can be applied are: 1. Commodities which favour performing labour, e.g., childcare, 2. Commodities correlated to negative/positive externalities requiring behavioural steering. In all other cases, it would be creating a more complex system with goals which can be achieved more easily and effectively by other types of taxes or benefits, or by policies outside the scope of the tax & benefits system. In regard to inequality, the consumption tax has a minimal effect and should not be used in an attempt to do so otherwise. Other taxes (and benefits) are far more apt in creating equality and such be used as such. This returns to the principles that the tax & benefits system should attempt to comply with a certain (envisioned) policy, the separate type of taxes may differ in their outcome.

## 4.2 Benefits

Benefit schemes are inherently different from tax schemes as they give monetary support to society instead of taking it. As such, they have three distinctive (other) objectives (Joumard, Pisu, & Bloch, 2013): 1. Redistribution over the life cycle, 2. Insurance against unforeseen, uninsurable risk, and 3. Avoid poverty or large discrepancies in income distribution. For this specific thesis, mainly the third objective will be reviewed, but the objectives are non-exclusive in respect of each other. For example, the focus of the pension system is on the first objective, but pension given can be done regressively which would also consider the third not. Another example is the out-of-work compensation, which focuses on the second objective, being (potentially) distributed using means-tested benefit (which will be explained later) by which it would also comply with the third objective. As such, the focus is potentially more semantical than causing hard limitations when reviewing benefits.

The use of benefits to combat inequality can be explained by the large ability to specifically target people who require assistance. However, designing benefits can be complex and non-trivial. To give a global consideration of the issues at hand, it is required to (at least) answer the following questions when contemplating benefits (Hidrobo, Hoddinott, Peterman, Margolies, & Moreira, 2014):

- Who needs to receive?
- How much such should be given?
- How frequent should the transfers be?
- For which period should the benefit be given?
- In which form does the benefit come?
- What are the conditions to be applied?
- Does the benefit cause the desired outcome?
- How cost-effective is it compared to other options?

It is important to be aware that benefits is an overarching term which represents three separate forms of benefits (Hidrobo, Hoddinott, Peterman, Margolies, & Moreira, 2014): 1. Cash, 2. Near cash (vouchers and food stamps), and 3. In-kind (also referred to as non-cash). While these separate forms all can contribute to the goal of influencing inequalities, the cash transfer benefits will primarily be reviewed as this direct financial intervention method is the most efficient when it comes to redistributing (IMF, 2014). Moreover, there are also other reasons to not review the other two types of benefits in this thesis. For near-cash benefits, it has been found that the propensity to consume food stamps in the form of food is similar to that of cash equivalents. The general economic theorem being that in-kind transfer acts the same as a monetary transfer of similar size when they are distributed in a smaller size compared to the consumption of that product (Hoynes & Schanzenbach, 2009). As such, the near cash and cash benefits are of such close resemblance in their consumption outcome that it would be creating an unnecessary complexity to this analysis to create a division between these two types. As for the in-kind benefits, these are largely connected to the investments done by the government in public services with the most important policies revolving around health, education, and housing (Callan & Keane, 2009; Paulus, Sutherland, & Tsaklogluo, 2010), but also social protection (IMF, 2014). Most of these items have already been reviewed in the first chapter making further analysis of these types of policies somewhat superfluous. Moreover, according to Paulus et al. (2010) the relative size of non-cash benefits compared to cash benefits is limited. This is made even more complex by the fact that the outcome of in-kind transfers on inequality can be dependent on the type of benefit. For example, education is an in-kind type of benefit in which primary education is progressive while tertiary education is regressive in nature (Callan & Keane, 2009). Overall, the main lesson to be learned is that it is important to realize that redistribution can occur through different types of benefits, but the size and impact of cash benefits are the largest when compared to the others.

In regard to cash benefits, it is important to understand a few basic principles. For every principle, it is important to state that the intentions, i.e., the primary schedule of the benefits, do not necessarily coincide with the outcome, i.e., the size of aid and the individual who receives it. As such, the following principles are theoretical in notion and

the practical outcome is dependent on adherence, application, and access (Van Lancker & Van Mechelen, 2015):

1. *Universal benefits:* Everyone has the right to financial aid
2. *Selective benefits:* Only a portion of the people meeting a criterion has the right to financial aid. As an example, Hood & Keiller (2016) showed that the two following types of selective principles are being used in the UK
    a. *Contributory:* A benefits scheme eligible for everyone who contributed
    b. *Qualification:* A benefits scheme based upon certain eligibility criteria
3. *Targeting benefits:* The amount of financial aid given is unequal among the population. As such, selective benefits are targeted by definition, but universal benefits can also have targeting properties.
    a. *Means-testing:* Relates income to the amount of financial aid received.

## Means-testing

Means-testing is (one of) the important procedures to improve the targeting of the poor with benefits (IMF, 2014). In this process, the size of the benefit is calculated in consideration of the income received by the recipient. In general, to lower the disincentive to work the means-testing schedule will decrease the benefit more slowly than the increase in income. As an example, if one would earn 100 euros more then the means-tested benefit will decrease by 10 euros. As such, a 10% penalty is given on the extra gained income. Mostly, in this process also minimum hours worked are frequently applied. The reason for this is to avoid that an individual with a high-paid job can mimic poverty through working part-time hours while also having gained the benefits of increased leisure time (IMF, 2014). For example, child support for a parent who works 20 hours for 2000 euros is deemed to be in lesser need of assistance when compared to a parent who works 40 hours with also 2000 euros of salary.

Problematic to the means-testing is that it can result in high effective marginal tax rates (Congressional Budget Office, 2012). This can be a consequence of the complex eligibility rules of the benefits system and its interaction with other taxes. Therefore, people are often unaware of which marginal tax rate they are experiencing. However, these rates can run up to 80% with records of >100% marginal tax rates. The Congressional Budget Office (CBO) reviewed the interaction between earnings and disposable income and found that the increase in disposable income is limited below an earnings income of 20.000 dollars for a single parent with a child, as shown in Figure 91. As such, these limited gains in income while performing (more) work can act as a disincentive to venture into the labour market.

Overall, the CBO (2012) claims that the problems revolving around means-testing occur due to the absence of complete income data of the recipient hampering the required discount on the benefit. Moreover, as the benefits are declared via various offices there is unawareness of already active benefits. As such, if all the benefits apply means-testing, the effective marginal tax rate can rapidly increase. Solutions to these problems are either: 1. having the complete data for the various enrolled benefits per person and adjusting the means-testing benefit accordingly (which has high bureaucratic costs), or 2. assuming that people enrol for every eligible benefit and adjust the benefit rates

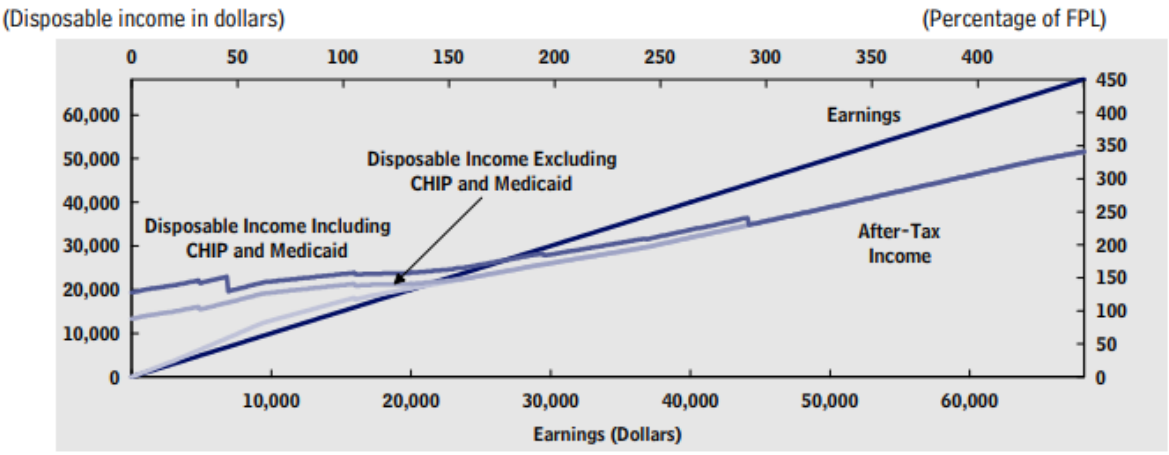


**Figure 91 The relation between earnings and disposable income.** *Note: The results are shown for the unmarried (financial) head of a household with one child and qualifying for both EITC and CTC in 2012. Moreover, all income is received from labour and tax deductions are efficiently claimed at state and governmental levels. Disposable income has been calculated as the sum of income and transfers minus tax liabilities. The market value of Medicaid has been estimated as the benefits given to a non-disabled child and adult living in the Commonwealth of Pennsylvania using data from the 2011 Annual Social and Economic Supplement of the Census Bureau's Current Population Survey. Results are based upon the author's calculations using survey data from the Census Bureau. FPL = Federal Poverty Guideline, CHIP = Children's Health Insurance Program, EITC = Earned Income Tax Credit, CTC = Child Tax Credit, TANF= Temporary Assistance for Needy Families, SNAP = Supplemental Nutrition Assistance Program. This figure has been obtained from* **(Congressional Budget Office, 2012)**

accordingly (Congressional Budget Office, 2012). However, the latter is known to be untrue by the CBO (2012) and has also been debunked by Mirrlees et al. (2011), stating that for every £1 entitled benefit there is 20p not being declared. They also point toward the complexity and the large abundance of different benefits causing that people are unaware that they can enrol for a certain benefit. An example of this complexity (in the UK) by a large number of available benefits is shown in Figure 92.

| | Expenditure (£m)[a] | % of total expenditure | Claimants[b] |
|---|---|---|---|
| **Personal tax credits** | | | |
| Child tax credit | 21,733[c,d] | 10.27% | 3,864,000[e,f,g] |
| Working tax credit | 5,908[c,d] | 2.79% | 2,374,200[e,g] |
| *Total personal tax credits* | *27,642* | *13.06%* | *4,400,800[h]* |
| **Benefits for families with children** | | | |
| Child benefit (including former one-parent benefit) | 11,281[i] | 5.33% | 7,153,935[j] |
| Guardian's allowance | 2[i] | 0.00% | Not available |
| Statutory maternity, paternity, shared parental & adoption pay | 2,449 | 1.16% | 269,000[k] |
| Maternity allowance | 443 | 0.21% | 63,000 |
| Sure Start maternity grant | 30[j] | 0.01% | 59,400[l] |
| *Total benefits for families with children* | *14,205* | *6.71%* | |
| **Benefits for unemployed people** | | | |
| Income-based jobseeker's allowance | 2,024 | 0.96% | 692,000[m] |
| Contribution-based jobseeker's allowance | 306 | 0.14% | |
| New enterprise allowance | 23 | 0.01% | 13,390[n] |
| *Total benefits for unemployed people* | *2,352* | *1.11%* | |
| **Benefits for people on low incomes** | | | |
| Income support | 2,705 | 1.28% | 706,000 |
| Housing benefit | 24,273 | 11.47% | 4,781,000 |
| Discretionary housing payments | 125 | 0.06% | Not available |
| Funeral payments | 40[j] | 0.02% | 28,700[j] |
| Cold weather payments | 4[j] | 0.00% | 154,700[j] |
| *Total benefits for people on low incomes* | *27,146* | *12.82%* | |
| **Benefits for older people** | | | |
| Basic state pension (contributory) | 68,003 | 32.12% | 12,857,000 |
| Basic state pension (non-contributory) | 108 | 0.05% | 46,000 |
| Additional state pension (and pension transfers) | 21,177[o] | 10.00% | Not available[p] |
| Financial Assistance Scheme | 209[e] | 0.10% | Not available |
| Pension credit | 6,078 | 2.87% | 2,074,000 |
| Over-75s television licences | 620[e] | 0.29% | 4,429,000[e] |
| Winter fuel payments | 2,080 | 0.98% | 12,260,000 |
| *Total benefits for older people* | *98,275* | *46.43%* | |
| **Benefits for sick and disabled people** | | | |
| Incapacity benefit | 75 | 0.04% | 68,000 |
| Employment and support allowance | 14,276 | 6.74% | 2,367,000 |
| Severe disablement allowance | 464 | 0.22% | 122,000 |
| Personal independence payment | 2,991 | 1.41% | 584,000[q] |
| Disability living allowance | 13,225 | 6.25% | 2,987,000[q] |
| Attendance allowance | 5,489 | 2.59% | 1,458,000[q] |
| Carer's allowance | 2,560 | 1.21% | 762,000[q] |
| Motability grants | 17[r] | 0.01% | Not available |
| Industrial injuries benefits | 869[s] | 0.41% | 313,000 |
| War pensions | 795[e,t] | 0.38% | 130,178[e,t,u] |
| Armed forces independence payment | 7 | 0.00% | 896[v] |
| Other[w] | 55 | 0.03% | Not available |
| *Total benefits for sick and disabled people* | *40,823* | *19.28%* | |
| **Benefits for bereaved people** | | | |
| Widow(er)s' and bereavement benefits | 569 | 0.27% | 92,000[x] |
| Industrial death benefit | 28 | 0.01% | 5,000 |
| *Total benefits for bereaved people* | *597* | *0.28%* | |
| **Other benefits** | | | |
| Christmas bonus | 160 | 0.08% | 16,035,000 |
| Universal credit | 483 | 0.23% | 225,002[y] |
| *Total other benefits* | *643* | *0.30%* | |
| **TOTAL** | 211,683 | 100.00% | |

**Figure 92 All various kinds of benefits and tax credits within Great Britain in the year 2015-16.** *Note: This figure has been obtained from* **(Hood & Keiller, 2016)**.

### Complexity of benefit

The effectiveness of targeting is largely dependent on the execution of the benefit programs but can cause large poverty reductions when done effectively (Van Lancker & Van Mechelen, 2015). However, it will be important to properly target the poor which is a difficulty in itself (Brown, Ravallion, & Van de Walle, 2017), as shown in Figure 93. Problems are that assumptions are made based upon a limited dataset which is extrapolated into a presumed wealth/income. While their research involves Africa which has a much less apt administration system when compared to Western civilizations, it will still be an impossibility to have 100% accuracy in the regards to finding the poor/rich. In part, the reliance on data has caused those individuals who are living "off the radar" are being missed, e.g., the homeless and institutionalized individuals. Moreover, slum dweller households are notorious for being missed and require more intense data collection methods (Falkingham & Namazie, 2001). In general, it should be warned that only targeting the individuals with known problems is a limited perspective of the actual problems occurring in society. As such, improvements and limitations of poverty measurements and coupled (targeted) benefits are to be aware of.

These findings are not new. The Mirrlees Review report (Mirrlees, et al., 2011) narrates a similar story where the abundance of different benefits caused a large network of interactions and perquisites of enrolment. This makes the system (inherently) complex, which is enhanced by the pressure to avoid multiple support claims via different benefit programs. Moreover, comprehending the programs in-depth, i.e., understanding changes in personal accounts, becomes almost impossible which causes those benefits are being missed. While the applicants have issues with filling for support, the administrative institutes must deal with complex cases which require (extra) resources to complete the claims adequately. This becomes even more complex because the benefit programs are enrolled via various institutes which complicates the coordination of the programs. As such, the desire to improve targeting can cause counterproductive effects on the ability to achieve the primary goal of aiding those who need it.

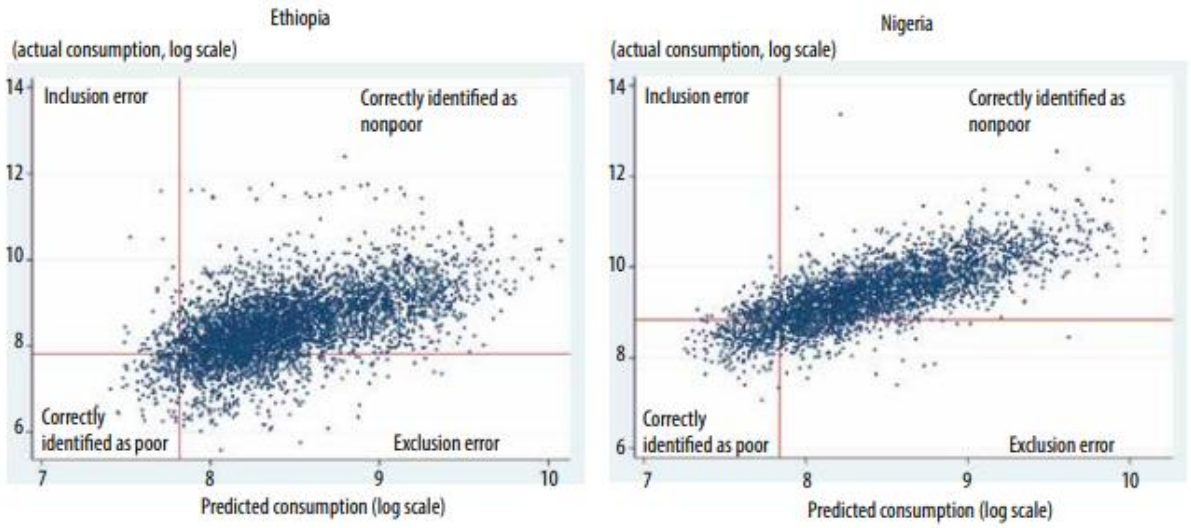


**Figure 93 The ability to correctly identify the poor versus the non-poor.** *Note: Red lines divide the population sample into the lowest 20% consumption group (poor) and the upper 80% consumption group. This figure has been obtained from* **(Brown, Ravallion, & Van de Walle, 2017)**

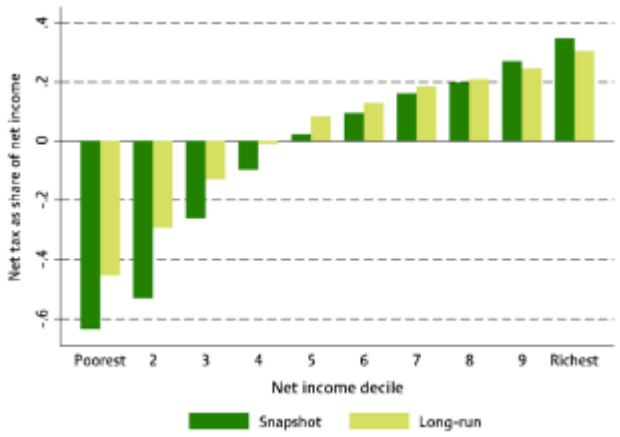


**Figure 94 Difference in the short-term and long-term net taxation across the income distribution.** *Note: Results are based upon the author's calculation using BHPS data. 'Snapshot' series are based upon individuals observed in the first wave and the long-run series are based upon individuals observed in each wave running from the first to eighteenth wave. Individuals were included when they were older than 16 and were not dependent children. Income has been measured in real values, equivalised, and discounted for in the long-run series. The changes in the net tax as a share of net income represent averages for every decile. This figure has been obtained from* **(Roantree & Shaw, 2018)**

To add to the complexity of the design in benefits, it is highlighted that the short-term and long-term effects of benefits can differ. In this matter, Roantree & Shaw (2018) find that benefits seemingly mainly contribute to the short-term alleviations of poverty but are less apt in reducing long-term poverty, as shown in Figure 94. They reason that in part this is caused by the fact that long-term inequality is lower than short-term (thus there is less to redistribute in the first place). But also, benefits are aimed at alleviating short-term problems such as assisting people who are out of work, a group who predominantly reside in the lower decile group. However, larger groups of the population will be out of work at some point in life (in the long-run assessment), making the assistance more of an intra-personal transfer than one might perceive at the start. The difference in short-term and long-term effects is also found in the public transfer domain overall. Bovenberg et al. (2008) showed that the redistribution in Denmark viewed from a long-term perspective is more of a matter of intra-personal transfers, i.e., from one's younger self to one's older self, than inter-personal transfers, i.e., between rich and poor persons. This is predominantly an effect of the pension system which causes that approximately 75% of the income tax dedicated to public transfers comes back to the same person later in life due to the pension funds. This has also been found by Falkingham & Harding (1996) showing that in the UK 62-71% of the redistribution is a matter of intra-personal transfer. As such, when designing a benefit, one must be aware of the difference (and goals) in short- or long-term changes where long-term effects can potentially be much more subtle.

### Pension funds

One of the most important benefits (at least in size) in most countries is the pension system. As shown by Marx et al. (2016), in most countries >50% of the redistribution is aimed at pension funds. This is in correspondence to the OECD report finding that 55% of the benefits by distributed via the pension system (Joumard, Pisu, & Bloch, 2013). The importance can also be noted by the finding that in the retired population almost everyone in the income distribution is a tax consumer except for a few countries which have a tipping point in the 10$^{th}$ decile from going from consumer to producer (Whiteford, 2021). On average, people older than 65 years have 90% of their total received benefits coming from pension funds (Joumard, Pisu, & Bloch, 2013). As such, the size of the pension program in the benefits system is enormous.

However, from a redistributive point of view, the efforts are only mild. The OECD (Joumard, Pisu, & Bloch, 2013) highlights that the benefits obtained from pensions differ

starkly between social classes with large importance for the shorter life expectancy in the lower socioeconomic classes. As stated by Sanchez-Romero et al. (2020) this age effect is the largest cause of making the pension system regressive in its format. According to Bartels & Neumann (2021), there is a tendency for countries with relatively more elderly to have increased annual redistributive transfers but are causing less redistribution in the long run. This could be caused by their increasing relative votive power, i.e., increased bargaining power, due to the increased presence of the elderly in society to demand beneficial treatment. In the recent publication of Klos et al. (2022), it is stipulated that reforms are essential as current demographic developments will not be able to maintain the current pension systems and the desired outcomes for intra- and inter-generational transfers should be reviewed.

### Other aspects

Not only the design of the benefit, but also the perception and framing of a benefit have an impact on the support and the implementation of a benefit policy (Marx, Salanauskaite, & Verbist, 2016). For example. one can observe a difference in universal and targeted benefits. Those benefits which attempt to target (parts of) the population non-specifically have higher support as there is no discrimination between people. The benefits are exemplified by the child benefit and universal pension benefits which are accessible to all residents (at some point in life) and are also expected regardless of income. As such, these benefits command high acceptance as they are not creating a significant advantage for a specific group in the population (Cavaillé & Trump, 2015). However, targeted benefits tend to become stigmatized due to their focussing nature. For example, jobless support is scrutinized as the receivers are "lazy" for being jobless. This effect causes that the benefit receives ill support and is being conditionalized to qualify for the benefit (Cavaillé & Trump, 2015). For example, one can only obtain jobless support while meeting the condition that the receivers respond to job vacancies regularly. This stigmatization has the negative consequence that the narrative of a particular benefit is sometimes disconnected from its purpose within the system. This leads to it being discussed as an individual entity to influence public opinion and create favour or discontent for that particular benefit. This simplification of discussing benefits singularly can hamper the system by inefficient policy drafting and disrupting the system (Adam, et al., 2010).

In general, when creating a benefits system, one should take note that a targeted nature can cause problems for its reception in the arena of political support. One could envision that a progressive format for a pension system could be perceived as a punishment to the 'smart and planned' individuals who have adequate retirement plans and incentivize the 'dumb and short-sighted' individuals without these plans. Such a narrative can create difficulties when attempting to gain political support for the implementation of such a policy. However, these issues regarding perception and support are not only occurring for benefits but also taxes are subjected to these kinds of problems. For example, Rowlingson et al. (2022) showed that wealth taxes are being scrutinized and people tend to avoid paying them.

Moreover, it should be noted that the benefits system is certainly not disconnected from the other topics discussed in this thesis. For example, Kristal et al. (2018) showed that there is benefit inequality which correlates with income inequality, i.e., low-wage

earners obtain fewer benefits. In part, this is caused by the fact that "bad" jobs have less legal protection to prevent from being cut in social contributions. The painful situation occurs that low-wage workers are being disadvantaged through income, but also systematic disadvantages are created because their jobs have flexible contracts with limited social security protection. This can (in part) be correlated to the lower wage bargaining strength of the lower-income population (Kristal, Cohen, & Navot, 2018), which already came to pass in the subsection Diverging income under 3.1. As such, improved functioning of the benefit (and tax) system will also be dependent on other items and should be reviewed in totality.

## 4.3 Chapter Conclusion

In this chapter, the governmental opportunities to influence and shape economic inequality through its tax & benefits system have been reviewed. In short, basic principles have been explained and various problematic notions have been highlighted revolving around the tax & benefits system. However, the process to maximize social welfare can be difficult as it is complicated by missing information and subjective inputs to the social welfare function (Sørensen, 2010). As such, it is uncertain what kind of effects would be caused by increased taxation rates as pre-emptive assets fail to adequately predict the outcome.

However, this does not mean that there have not been any historic strides to alter inequalities. According to Haveman et al. (2015), the 'War on Poverty' in the US had its marks initially on poverty among the elderly and has been fought off effectively using the pension system. However, it got in turn problems with single mother households and children which is seemingly a larger struggle. His problem has already been mentioned earlier in the Conclusion of Chapter 3 where in the UK it was attempted to battle poverty among children with the Child Poverty Act but has severely failed in doing so. Overall, the tax & benefits system has a notion of trial and error to it, but attempts can be made to properly use academic knowledge to improve the odds of finding proper policies.

### Conceptual model's building blocks

To complete the analysis for this chapter, the following 'building blocks' have been synthesized for the conceptual model. In contrast to the previous chapters, the separate sections are bundled into one overarching header. The reason for doing so is the close interaction of the tax and benefit system. As mentioned earlier by Mirrlees et al. (2011), it is advised to review it as a complete system instead of standalone programs.

# Taxes & Benefits

*a. Tax & benefit design – Tax Avoidance & Evasion*

The various forms of different taxes and a multitude of exemptions and reliefs enable the potential for tax evasion and avoidance. More complex tax design requires higher administration which in turn costs higher work pressure for the administrator. As such, they have less ability to reduce evasion and avoidance as they are experiencing divided attention due to other tasks.

*b. Tax & benefit design – Income Inequality*

The interaction between tax and benefits through means-testing and exemptions and reliefs causes that the bottom deciles experience higher tax rates than the top incomes. As such, relative income redistribution is hampered by the design.

*c. Tax & benefit design – Labour Bargaining*

The lower deciles are employed in types of jobs which limit social security and have reduced opportunities in bargaining for favourable incomes. This is in contrast to top incomes who are enabled to bargain for income types with favourable taxation rates.

*d. Tax & benefit design – Wealth Inequality*

The inherent design of the tax systems gives preference for capital income which supports the investment into assets with a (high) return rate. The access to these types of returns is predominantly experienced by the top of the wealth distribution. However, the solution to the inequality is not offered through a recurrent wealth tax but by reducing the income and favourability attached to wealth.

*e. Tax & benefits design – Public Perception*

Tax & benefits are importantly connected to the perception of society. While economic theory can direct favourable tax design, society should also accept it to create political momentum to draft its implementation.

*f. Wealth Transfer – Wealth Inequality*

The ability to transfer wealth with low tax rates causes that wealth inequalities can be transferred along sanguine lines.

*g. Wealth Transfer – Opportunity Inequality*

The ability to transfer wealth (with low tax rates) causes the ability to transfer socioeconomic position from the parent to the offspring. As such, offspring with rich parents have larger opportunities as compared to their poorer counterparts.

*h. Public Perception – Tax Avoidance & Evasion*

Depending on the perception of a tax & benefit design, the forcefulness to cohere to its policy will differ. Taxes which are deemed to be "bad" will have more problematic enforcement than those that are perceived as "good". Similar narratives are warranted for benefits, those that are scrutinized experience a lower willingness to be enrolled for.

# 5. The Netherlands and inequality – Flat income and Himalayan wealth

In the previous four chapters, the foundation of the conceptual framework has been created. In this chapter, the conceptual framework will be used to analyse the Netherlands. For the sake of consistency, the topic will be reviewed in the same order as the chapters. However, there will also be an addition of a preliminary review of the impact of crises, i.e., the corona epidemic and the Ukraine war, on economic inequality. Both crises have had their impact on society and resulted in changing regulations by the government in an attempt to offset the negative effects and spread the burden among society.

To manage expectations for you, the reader, it is noted that the application of the conceptual model on the Netherland will be kept short as it is not the core goal of this thesis. It is meant as a preliminary proof of principle (showing viability) and test case scenario (experiencing limitations and potential improvements). As such, it will sometimes be difficult to persuasively create distinguishment between certain characteristics. For example, mobility and stratification are two highly related concepts which require detail to create an adequate distinction. Moreover, due to time constraints and the reduced information available (as only literature reviewing the Netherlands will be of use), not every interaction can be (properly) discussed. As such, the main purpose is on the evaluation of the application, the provided overview of economic inequality within the Netherlands is perceived to be a bonus.

## 5.1 Inequality's influences

The observed effects of economic inequality are correlated to health, education, democracy, and economy. However, when reviewing interactions related to economic inequality, there are also other interactions found within the Netherlands. For example, the interaction between crime and poverty can be exemplified by cases within the courtroom of Schiphol where impoverished individuals are resorting to drug trafficking. These incidents occur because they cannot meet their financial needs to buy essential goods, e.g., medication for their children (NRC, 2022). But also, climate sustainability and inequality have some clear interactions. This has been exemplified by a report of the CE Delft showing that of the 750 million euros of subsidies, 624 million euros were dedicated to the upper 50% of household incomes and 153 million to the lower 50% of household incomes (CE Delft, 2017). With the increasing energy prices (which occurred drastically by almost doubling in 2022 compared to 2021 (CBS, sd)) and the related energy poverty, unsustainable housing can increase inequalities by enhancing expenditure of the less wealthy (TNO, 2021). These examples show what has been indicated within the thesis, that other parameters, such as justice & crime and climate sustainability, potentially also should be included in future extensions of this thesis to make the overview more complete.

### Health

In the framework, it has been found that health was related to three aspects: 1. Financial Resources, 2. Stratification, and 3. Opportunity Inequality.

### *Financial Resources*

Van der Veer & Jungmann (2016) found that there is a correlation between financial problems and health problems but that the principal causation between the two remains unknown. In general, the explanation uses the absolute income hypothesis, i.e., individuals have financial limitations to afford healthy behaviour. This can also cause stress which in turn causes bad decision making, e.g., starting to smoke to cope with stress. However, they also note that there could be reverse causality, because health-related issues lead to higher costs or income losses. In their conclusion, they highlight that although the exact causation is unclear (and the direction of causality is most likely bi-directional), there is large support for an integrative policy which connects aid in both health and finances to improve outcomes.

### *Stratification*

There are empirically robust indications that stratification, positively correlating with educational level, is predictive of health outcomes, as shown in Figure 95. It is shown that problems within the social layers are occurring due to deficiencies in financial, cultural, and social resources (André, Kraaykamp, & Meuleman, 2018). For example, practising sports or having a gym subscription relates to financial investments, or problem signalling by others requires a social network where the knowledge and support capabilities of the individuals in the network relate to socioeconomic strata (Gesthuizen, Huijts, & Kraaykamp, 2012). In total, these differences cause a 7 year life expectancy discrepancy for females and 6 years for males. However, when discerning good health years, the differences become even large averaging 17 and 14 years for females and males respectively (CBS, 2015).

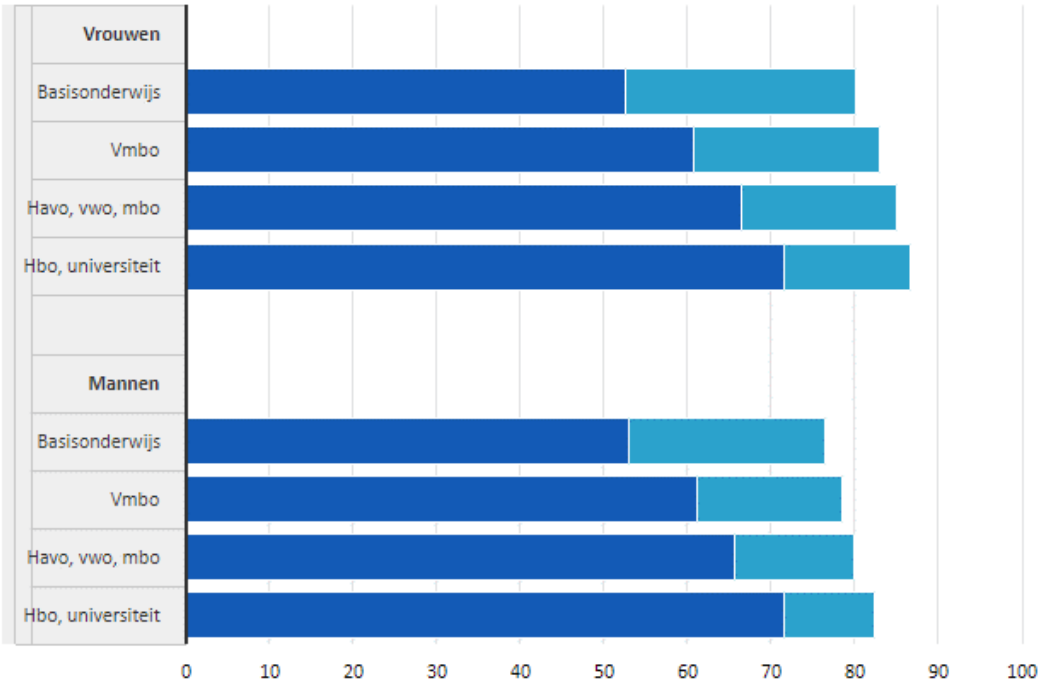


**Figure 95 Life expectancy at birth according to educational level.** *Note: Dark blue indicates life in good health and light blue indicates life in less good health. The upper bars indicate female and lower bars male life expectancy. Educational levels (from top to bottom) are primary schooling, lower high school diploma, upper high school diploma, and college & university level. This figure has been obtained from* **(CBS, 2015)**.

These correlations occur due to lifestyle differences between(educational) groups. For example, smoking is much more common among low educated people when compared to individuals having a university level degree, i.e., 33% compared to 10% respectively, and the average BMI level also shows similar trends, i.e., 26.8 compared to 24.4 respectively (André, Kraaykamp, & Meuleman, 2018). These differences become the most apparent when reviewing the cumulative differences in healthy behaviour. Using that perspective, it is found that highly educated people are 50% more likely to exhibit relatively more healthy behaviour as opposed to low educated people (André, Kraaykamp, & Meuleman, 2018). In part, this effect is caused by differences in knowledge about health-related information and the ability to convert that knowledge into healthy behaviour (Rademakers, 2014).

However, while health related differences between socioeconomic groups are increasing, there are also differences within these groups. Mierau (2021) finds that there are people who achieve good health within poor neighbourhoods and poor health within rich neighbourhoods. As such, he hypothesizes that there could be specific indicators which are not specifically related to socioeconomic groups, but to certain types of behaviour. Therefore, he advocates that investigating differences within groups can potentially be of higher importance than differences between groups in the effort to find policies which can contribute to good health.

### *Opportunity Inequality*

There has been limited research in the regard to the correlation between health and equality of opportunity. Mostly it has been connected to differences between immigrants and non-immigrants. For example, the Social and Cultural Planning bureau (Huijnk, 2020) found that 12% of the 29% of non-Western immigrants who are not participating in the job market is a caused by health issues. However, the effect of health issues should not be overestimated because the relative impact of health on job employment between non-Western immigrations and Dutch residents is of less importance when compared to job experience and educational level (2,1% versus 15,6% and 3,7% respectively). Moreover, the effects of health are mostly short run effects caused by the "refugee entry effect", i.e., mental health issues occurring after entering a country causing reduced job opportunities. However, in the long run, they find that health and opportunity are only weakly related (2020).

However, it is of interest to realize that 'flex work' causes more physical and psycho-social strain on an employee as compared to fixed contracts. Moreover, due to the reduced social support, income insecurity, and reduced autonomy, they incur higher risks for their health and prolonged availability in the job market. These factors are especially hurting young employees between 25-45, which causes increased burn-out among this group (Goudswaard A. , 2017). Because the low-income population is more frequently employed as flex workers (about 1/3$^{rd}$ of the total workforce (in 2014) is employed as a flex worker) (UWV, 2015), it is not illogical that they will also incur greater odds of having negatives health effects from work. These negative effects, such as burn-outs, could potentially reduce their opportunities to improve their career prospects or human capital can therefore be impacted on the long run. This interconnection can be explained through the model of Vrooman et al. (2014) which states that health, as part of personal capital (consisting of physical, mental, and esthetical health), contributes to the opportunities

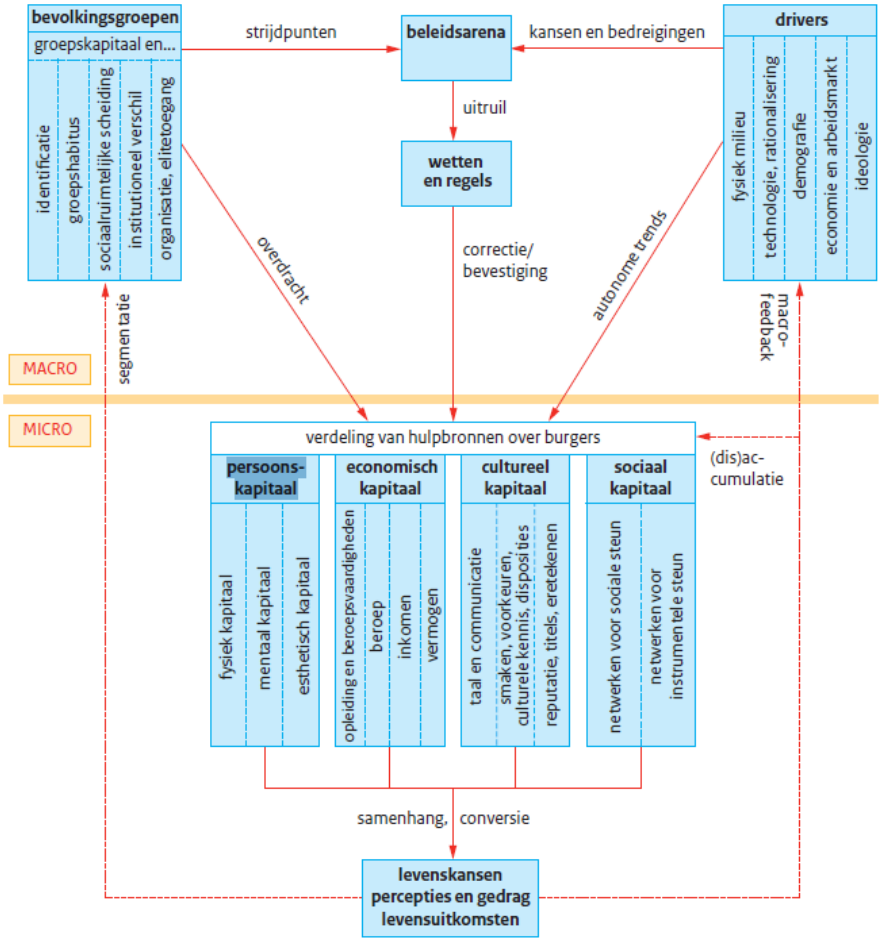


**Figure 96 Theoretical model explaining opportunities and outcomes in life.** *Note: this figure has been obtained from* **(Vrooman, Gijsberts, & Boelhouwer, 2014)**

one has in life, as shown in Figure 96. The value of this personal capital correlates positively with educational level. Especially mental health, e.g., self-confidence, seems to be important in the odds on the job market. As seen earlier, lower incomes endure more stress and have problems with their mental health and, as such, could potentially suffer negative consequences on their opportunity in the job market.

## Democracy

In the framework, it has been found that democracy was related to five aspects: 1. Disconnection, 2. Unawareness, 3. Stratification, 4. Economic inequality, and 5. Policy approval.

### *Disconnection*

The National Electorate Research (Nationaal Kiesonderzoek) (Sipma, Lubbers, van der Meer, Spierings, & Jacobs, 2021) finds that there is an increase in resentment towards the "The Hague" politics. This has coincided with the globalization of politics which is prioritising issues of global warming, multicultural societies, and European integration. However, the resentment is also connected to the trust in the political system which is a fluctuating characteristic. In 2021, the trust in the government had severely diminished (after having risen sharply due to the 'rally around the flag' principle during the start of the coronavirus outbreak) due to the long formation period which was heavily

slowed due to the "Omtzigt functie elders" note. This process seems troubling as the individuals with increased resentment have a lower tendency to vote during the elections which is correlating with low-education, low-income, and (non-Western) migration background. However, the National Electorate Research does remark that non-voting is rather a combination of lack of interest in politics, resentment, and lack of self-confidence (distrust to make the right political decision) instead of resentment alone (Sipma, Lubbers, van der Meer, Spierings, & Jacobs, 2021).

The National Ombudsman of the Netherlands (Nationale Ombudsman, 2021) has warned about the increasing distance between the government and the population. In the year report, the very first theme is poverty (mainly concerning the toeslagenaffaire) and the consequences of the coronavirus causing rising financial problems within certain groups of the population. Next to this problem, they also find that the government and municipalities are attempting to improve input and participation among the citizens, but they refrain from giving them consequential influence. As such, people feel their input is a mere façade as they don't experience any change (Nationale Ombudsman, 2021). An example of this problem is exemplified in Amsterdam where the municipality created regulations concerning the marketplaces. The municipality's ombudsman stated in an extremely negative report that the municipality made significant crucial errors by ignoring input from the marketman causing distrust and a disconnect between citizens and policymakers (NRC, 2022).

### *Unawareness*

I could not find any literature on the awareness of inequality within the Netherlands. The closest research found on the topic was from Salverda et al. (2013) showing that the increase in inequality did not cause a significant shift towards left-winged parties (those who mostly favour redistribution). As such, there are no indications of the redistributive perspective. However, it cannot be distinguished whether this is caused by unawareness or because of the unequal power perspective.

### *Policy approval*

Schakel (2021) found that biased policy approval occurs within the Netherlands which correlates with economic inequality, as shown in Figure 97. He shows that the opinion of the 90$^{th}$ income percentile has a high influence on the approval rate of policies. This is in contrast to the 10$^{th}$ income percentile and the mean levels. According to his research, this is mainly caused by corporate lobbying entities which have a more predominant effect on policy approval as compared to civil society groups. As such, the Netherlands seems to suffer from the unequal power perspective. If so, continuous efforts to increase the involvement of society in the democratic process seem to be of lesser worth as opposed to reducing the ability of the rich to shape policies to their demands (Schakel, 2021).

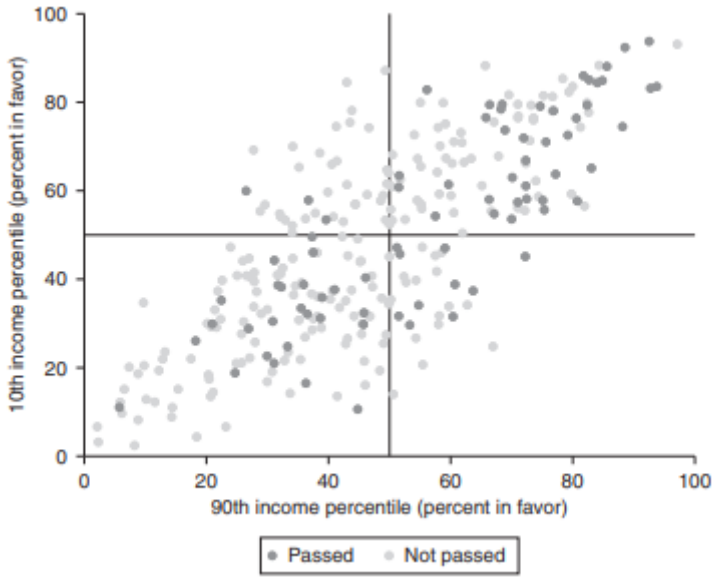


**Figure 97 Policy approval according to favouring of the rich and poor.** *Note: The x-axis represents the rich and the y-axis the poor. Light shaded grey unapproved policies and dark grey approved policies. This figure has been obtained from* **(Schakel, 2021)**.

### *Economic inequality*

Kremer et al. (2014) find that there has been a decrease in voter turnout with increasing Gini values, as shown in Figure 98. As such, one could state that there is a potential influence of economic inequality on democracy. However, while a similar trend was noticed by Salverda et al. (2013), they show that the decrease in voter turnout is distributed over all socioeconomic groups. As such, increasing inequality does not seem to cause a discrepancy in voting between social groups. Therefore, it seems unlikely that rising economic inequality has had a significant impact on relative voting outcomes in the Netherlands.

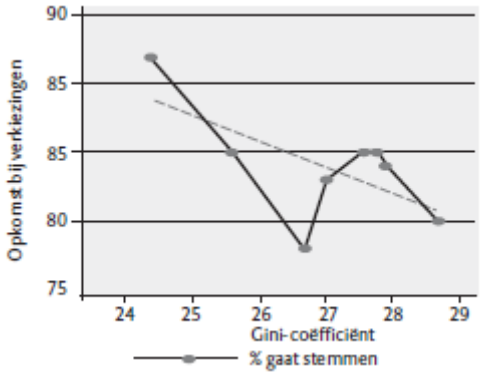


**Figure 98 Correlation between Gini index and voting participation.** *Note: This figure has been obtained from* **(Kremer, Bovens, Schrijvers, & Went, 2014)**

### *Stratification*

While in the health domain it has been found that there is a tendency for the absolute income hypothesis, i.e., having a shortage of funds to buy essential needs, in the political and social domain, it has been found that a variant of the relative income

hypothesis, i.e., the psycho-social theorem[13], is the most relevant explanatory theorem to explain occurrences within the Netherlands (Kremer, Bovens, Schrijvers, & Went, 2014). In this theorem, the differences between social groups cause a variety of problems, including a disconnect in politics, distrust in (governmental) institutes, and social segregation between income groups, this echoes with the relative income hypothesis.

## Education

In the framework, it has been found that education was related to four aspects: 1. Mobility, 2. Stratification, 3. Income Inequality, and 4. Opportunity Inequality.

### *Mobility*

The Netherlands attempts to improve (educational) mobility by giving individuals the ability to climb the educational ladder by pilling diplomas. However, this procedure has become increasingly difficult and has been limiting equality in opportunity (CPB, 2022). Overall, the CPB states in a different report that differences between children from different socioeconomic backgrounds persist throughout life. The exceptions are for children with a migration background who tend to play "catch-up" with the other children from the same socioeconomic background. However, the differences between the socioeconomic levels will persist, also for the children with a migration background (CPB, 2020).

While in international reports, advantages have been shown of pre-primary schooling to improve mobility and educational outcome, the outcomes within the Netherlands have been found to be limited. The government implemented the 'Regeling voor- vroegschoolse educatie' in the 2000s that was primarily aimed at children from disadvantaged backgrounds. This has changed around the 2010s to include all children, but the outcomes are yet to become known (Salverda, Haas, de Graaf-zijl, Lancee, & Notten, 2013). The CPB (2020) gives a similar statement that the data are inconclusive and further research is required to assert the impact of pre-primary schooling.

### *Stratification*

In the report of Salverda et al. (2013), they state that the educational system is actively increasing inequality between groups. The process of early differentiation in high school between VMBO, HAVO, and VWO is causing that the lower educational levels do not have able peers as a reference point to whom they can develop. As such, they are less able to grow their qualities more adequately. This is in contrast to the higher secondary level where students are surrounded by only able peers benefitting from each other's abilities. Salverda et al. (2013) also state that stratification occurs due to the free school choice system. This enabled segregation of schools by admission differences, causing, e.g., schools with predominantly white or black students (especially in the large cities). As such, students with better opportunities can claim better schools which enhances future opportunity differences. This in part coincides with the process of higher quality teachers who avoid working at schools with low educational performing schools (CPB, 2020).

[13] The psychosocial theorem revolves around the notion that increasing differences in social status causes increased stress and distrust between social layers and the negative impact of economic inequality on social capital. I will refrain from further explaining this theorem as it is at the outer edge of this thesis. For more information one can consult Layte (2011).

### *Inequality of Income*

An increase in the educational level is also occurring within the Netherlands. As shown by the CBS (Maslowski, 2020), individuals who obtained a higher educational level, i.e., HBO + WO, increased from 32% in 2008 to 40% in 2019. However, it is uncertain whether this is leading to social congestion. As noted by the CBS (ter Weel, Loonongelijkheid in Nederland stijgt, 2012), the demand for higher educated individuals seems to be increasing which causes that demand and supply are keeping track of each other. Moreover, the incomes of higher educated people seem to increase more quickly as compared to the other educational level jobs. The trouble in the job market is more among the middle educational level jobs. They are having issues due to technological advancements, i.e., ICT, which is causing their job supply to decline. As such, they have to attempt to either climb up (which is complicated due to the already large supply of highly educated individuals) or fall down (potentially causing social congestion at the bottom) the job ladder. In sum, the problem does not so much seem to occur among the upper levels, it is the middle level which is potentially in danger of congestion and depending on their movement, can cause troubles in other positions.

### *Inequality of Opportunity*

The 'Onderwijsraad' warned for increased inequality of opportunity due to paid assistance within the educational system. They note that shadow education is becoming increasingly entangled with the public education. Currently, about a quarter of the students in primary and high schools are using supplementary support offered by shadow education in the aid of their curriculum. Even more so, parents are being advised in public schools to enrol their children into shadow education curriculums to improve their grades. This has the result that the parents are burdened with extra costs, which especially poor parents will have trouble to afford (Onderwijsraad, 2021). Overall, there has been a trend of increasing revenue generation by shadow education corporations (rising from 48.5 million to 69.2 million between 2015-2017) and increasing number of private primary schools, which increased from 35 in 2015 to 60 in 2018 (NRC, 2021).

The reason to do so seems obvious when reviewing the results of shadow education. Bisschop et al. (2019), for example, showed that within the Netherlands the students who enrolled in supplementary education via shadow education scored 0,7 points higher at their central exam than those who did not enrol. This enrolment into supplementary education was most strongly correlated to income, and not educational level nor education level of the parents.

To avoid shadow education hurdling further into the educational system, the 'Onderwijsraad' concludes that there should be a prohibition on the advertisement of shadow education and assistance inside public schools. The consensus should be that every educational aspect is supplied via the public system and should conform to its public characteristic, i.e., availability to everyone (Onderwijsraad, 2021). However, researcher Elffers states that shadow education is here to stay as parents will promote the existence of shadow education because of their desire to get the best perspectives for their children (NRC, 2021). Moreover, also the government is aiding the existence of shadow education after the quality issues caused in education as a consequence of the backlash of corona. As it is deemed impossible for public education to repair the damages by itself, educational institutes have become dependent on the aid of shadow education (NRC, 2021). This is

the complete opposite of the desired perspective of the Onderwijsraad (2021) mentioned earlier.

#### Economy

In the framework, it has been found that economy was related to one aspect: 1. Economic growth.

##### *Economic growth*

In the report of Kremer et al. (2014), the notion that economic inequality can cause reduced growth has been highlighted as a known problem. While they do not directly make the same investigation for the Netherlands, i.e., inequality versus economic growth, they do state that the tendency of wage moderation has significant consequences for the domestic market. They state that the continuous (past) wage moderation caused a hindrance in the demand for goods. Although it profited international operating corporations, the domestic operating corporations are suffering from reduced demand. To improve the market, wage moderation should be cancelled and more effort should be brought to increase wages.

This notion has been echoed by Storm (2021) stating that reduced economic growth can most likely be connected to a reduction in aggregate demand. This is a consequence of increasing income inequality causing reduced disposable income which in turn reduces demand by the poor. This can be put into a wider perspective where globalization causes (higher income) jobs to be moved overseas leaving a relatively larger number of low-income jobs within the Netherlands. This is aggravated by financialization accruing wealth from the real economy stunting investments and R&D causing consequential reduced productivity growth. This fits the idea that the Netherlands, being a wage-led economy, is hindered by reducing wages (Storm & Naastepad, 2013).

### 5.2 Quantifying inequality

The conceptual framework teaches that data is important when reviewing economic inequality. It is required to know what is occurring within a country, i.e., data collection, and how to communicate the finding, i.e., quantification. These issues connect, for example, to public awareness and the ability to properly. In regard to income inequality, there are strong indicators that life is not as beautiful as often represented. For example, while the Netherlands has one of the lowest disposable income inequalities (van Bavel, 2014), it also has incredibly low increases in median gross income. The income rise is even lower when compared to the US (Salverda, 2014), as shown in Figure 99. The increasing gap between top and bottom becomes more easily interpretable when reviewing the evolution of the incomes for the various income deciles (Salverda, 2014), as shown in Figure 100. Overall, while it can be stated that the Netherlands has one of the lowest Gini coefficients, the story of income evolution seems less rosy.

When reviewing wealth inequality, the picture does not become much brighter. The Ministry of Finance (Ministerie van Financien, 2020) found that wealth inequality within the Netherlands is one of the most extreme worldwide, being second worldwide with the top 10% owning 2/3$^{rd}$ of all the wealth. Dutch citizens have accumulated roughly 3.000 billion euros, which is four times the national GDP. Of this wealth, about 46% is in pension funds, 21% in housing, 14% in substantial interest, 11% in financial assets, and

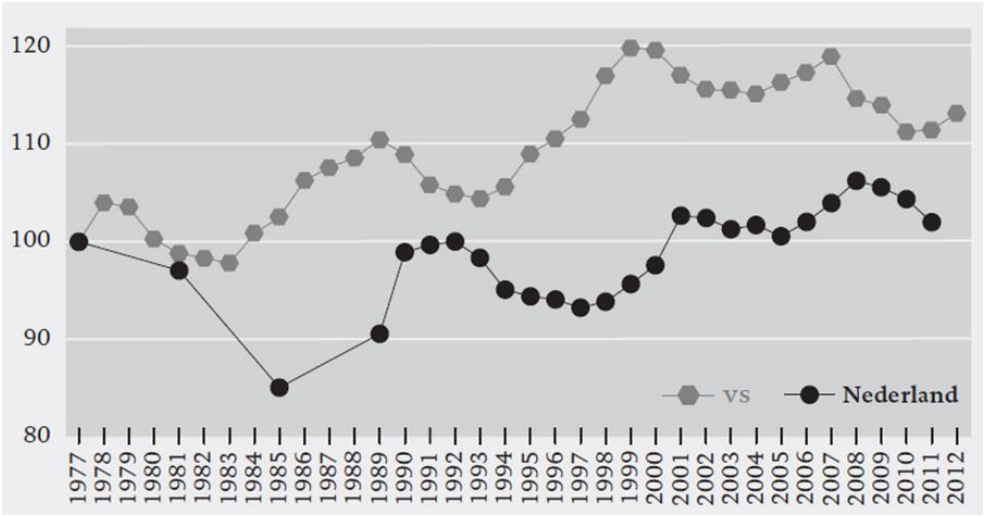


**Figure 99 Comparison of real gross household income between the US and the Netherland.** *Note: Dark line represents the Netherlands, grey line represents the US. Income has been normalized to income in 1977. This figure has been obtained from* **(Salverda, 2014)**.

the remaining 8% in other kinds of wealth. It is interesting to note that the type of asset is also unequally distributed. For example, for a large group of people, being 90-95% of the people the main contributor (being either positive or negative) to wealth is real estate. However, the richest 1% of the population owns over 80% of the "aanmerkelijk belang" (which are options and stocks) (Ministerie van Financien, 2020).

While these findings relate to known data, it has recently been found that the CBS made errors in their calculations and 147 billion in "aanmerkelijk belang" (to memorize, owned by the top 1%) and 5.9 billion in debt (primarily among the poor) was "missed" (NOS, 2021). It is of interest to note that data presentation is also of high importance. For example, Salverda & Van Bavel (2017) state that the CBS also meddles in presenting the data, giving a more positive narrative of the inequality data by selectively presenting outcomes while they state that inequality within the Netherlands is not that rosy. As to

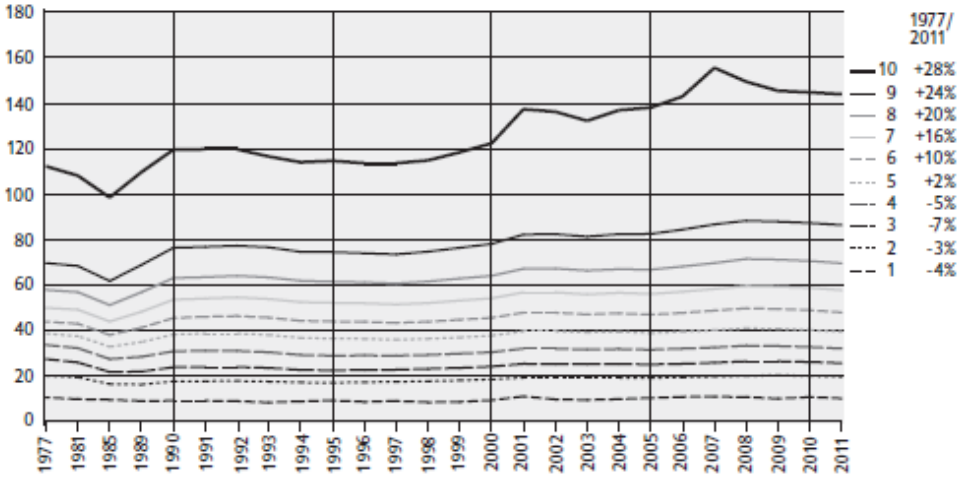


**Figure 100 Trend of the decile gross income group between 1977-2011.** *Note: Y-axis represents gross income. In 2000 calculations changed due to different inclusion of pension and rent benefits. This data used the older calculation method which knowingly decreased inequality slightly. The jump in income in 2017 for the top 10% is caused by a once-in-a-lifetime tax exemption which predominantly caused advantages among the top 1%. As such, it represents an anomaly which should be interpreted as a straight line between 2006-2008. Results have been calculated by the article's author using data from the CBS. This figure has been obtained from* **(Kremer, Bovens, Schrijvers, & Went, 2014)**

say, one needs the proper data which is presented transparently and effectively, to be able to devise proper policy.

> *"CBS meet méér ongelijkheid, maar verkoopt het als mínder"* – W. Salverda & B. van Bavel (2017, p. 1)

## Data collection

In the framework it has been found that data collection was related to two aspects: 1. Data collection. and 2. Undocumented inequality.

### *Data collection*

The CBS states that they use tax & benefits data to evaluate the whole population (CBS, 2017). As such, they do not use cut-off values for the upper incomes. They do not attempt to refine their data with population surveys, nor with rich list data sets. Recently, doubts have been raised concerning this procedure by Toussaint et al. (2020). They stated that the data collection mistakes made by the CBS led to undervaluing the wealth inequality within the Netherlands. When comparative analysis would be performed with the rich list, i.e., Quote 500, more information could be acquired regarding the very rich. Moreover, CBS (2017) calculates inequality based upon the standardized household level (adjusting household income for household size) instead of the individual level which is done by the OECD and Eurostat.

### *Undocumented inequality*

The CPB estimates that 60 billion euros (6% of the Dutch GDP) are residing in tax heavens in an attempt to benefit from tax evasion and avoidance[14] (Lejour, Leenders, Rabaté, & van 't Riet, 2020). The usage of these tools predominantly occurs among the richest household, i.e., the top 10% of Dutch households were responsible for 95% of the voluntary disclosure scheme between 2002-2018, and the usage of the disclosure scheme rises with increasing wealth percentiles, as shown in Figure 101. Interestingly, when the voluntary declaration scheme has been used, the declared wealth stays within the tax system in the following years and brings a consistent rise in tax revenue. However, the impact of unreported wealth has a significant impact on the inequality measurement. For example, the voluntary declaration scheme has caused an adjustment of the wealth owned by the richest 10% from 64% to 66%.

While it has been found that there is financial undocumented inequality, there are various other types of undocumented data which also concern inequality. For example, there has been a growing number of homeless people with income but without housing (Klein, 2022). These homeless people are not adequately covered by the official statistics on income and wealth inequality. The CBS also notes this that the economic data can give an incomplete representation of inequality and are working on an integration of economic, social, and human capital (Bos, van den Brakel, & Otten, 2018).

[14] According to the fiscal professor Anna Gunn tax avoidance could better be termed tax planning, being less loaden term and more accurately representing the occurrence. Moreover, she notes that tax avoidance can also be illegitimate due to fraus legis doctrine, i.e., a procedure solely performed to oppose the spirit of the law is unlawful and prosecutable (Kuys, 2021).

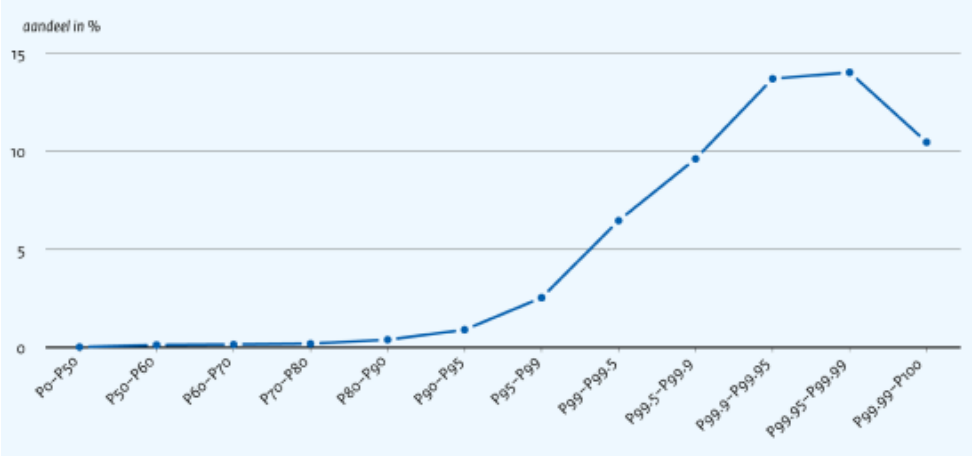


**Figure 101 Relative contribution per wealth group to the voluntary declaration scheme.** *Note: The data considers all declarations made between 2002-2018. This figure has been obtained from* **(Lejour, Leenders, Rabaté, & van 't Riet, 2020)**

## Quantification

In the framework it has been found that data quantification was related to one aspect: 1. Measurements.

### *Measurements*

The CBS (2021) reviewed inequality in the Netherlands over the past 40 years and found that there has been a significant increase in income and wealth inequality. The Gini index of the market and expendable incomes rose from 45,9 and 23,8 in 1977 to 54,4 and 29,1 in 2019. While most of this increase occurred between 1977-1990, the story is different for the top-bottom decile ratio. The Gini index hardly increased after 1990, but the top-bottom decile ratio for the Netherlands has been steadily increasing (Kremer, Bovens, Schrijvers, & Went, 2014), as shown in Figure 102.

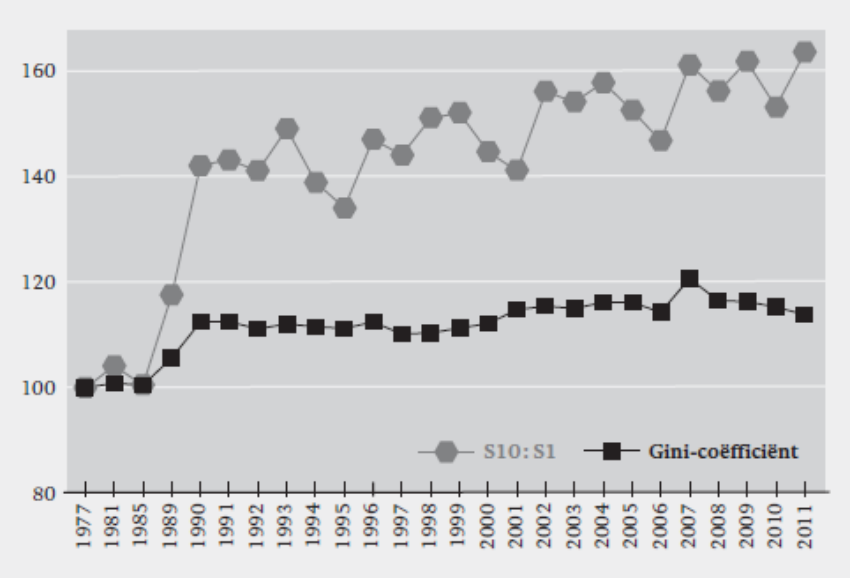


**Figure 102 Trend in top-bottom decile ratio and Gini coefficient.** *Note: Indices are calculated using market income between 1977-2011. The indices have been normalized at 100 in 1977. Results have been calculated by the article's author using data from the CBS. This figure has been obtained from* **(Kremer, Bovens, Schrijvers, & Went, 2014)**

However, in line with the explanation offered in an earlier chapter, inequality within the Netherlands is smaller when measured over a life cycle perspective. This is a consequence of the fact that many people earn a low (sometimes even negative) income when they are young but earn more later in life. For example, the lower two income deciles of the income distribution include students who earn more income later in life. Similarly, firm owners may experience lower incomes during bad years for their companies, but these bad years will average out with better years. As a result, when income inequality is measured while taking these life-cycle patterns into account, the Gini for the Netherlands is 26 points, which is much lower than the Gini of 48 points when inequality is measured based on present incomes (Waaijers & Lever, 2013). This is an important notion as inequality is considered less of a problem when high mobility is occurring. The fact that life-cycle inequality is much lower indicates that a form of income mobility is occurring.

Wealth inequality in the Netherlands is the second highest worldwide, only surpassed by wealth inequality in the USA. (Toussaint, van Bavel, Salverda, & Teulings, 2020), with a Gini-index around the 0,8 (van Bavel, 2014). While the CBS had been reporting that wealth inequality was decreasing until 2021, NOS (2021) reported in the same year that the CBS had made mistakes during the calculation. Upon recalculation, they "found" 132 billion euros in missing wealth (compared to the total of 1669 billion euros) which is primarily owned by the top 10% of wealth owners. Moreover, they found 5,9 billion euros in "missing" debt (compared to the total 113,8 billion euros) which is primarily owned by the poorest households. The CBS has not published any new reports regarding wealth inequality as of today. The latest publication of the CBS represents inequality as Pen's parade[15], as shown in Figure 103. The data show that the first 15% of the distribution owns negative wealth and the median is 60.500 euros, compared to an average of 231.900 euros. Put more strikingly, the bottom 60% owns a mere 1% of all the wealth and the top 10% own roughly 2/3rd of the wealth (Kremer, Bovens, Schrijvers, & Went, 2014).

With regard to poverty, the lower poverty line is set at €1039,- per month (when a bonus living package is added it comes to €1135,-) (Sociaal en Cultureel Planbureau, 2019), indexation is shown in Figure 104. According to CBS, there were approximately 1 million people below the low-income boundary, of which 398 thousand were below this boundary for more than 4 years (CBS, 2020). The social groups with the highest relative risk to be below the poverty line were non-Western immigrants, (19,9%, (CBS, 2020)), solitary living adults without a child (21%, (CBS, 2019)), and solitary living parents with a child younger than 18 (22%, (CBS, 2019)). When reviewing the chances of getting into poverty, it can be shown that the pension system is highly effective in lowering the odds of poverty, as shown in Figure 105. This is caused by the state-provided pension which provides security in income (CBS, 2019).

[15] Pen's parade is a visualization where the income distribution is a march of people passing by within one hour. The height of the passing individuals is normalized by stating that the individual with average wealth also has the average height of the population. It has been developed by Jan Pen, a Dutch economist, in 1971 (Crook, 2006).

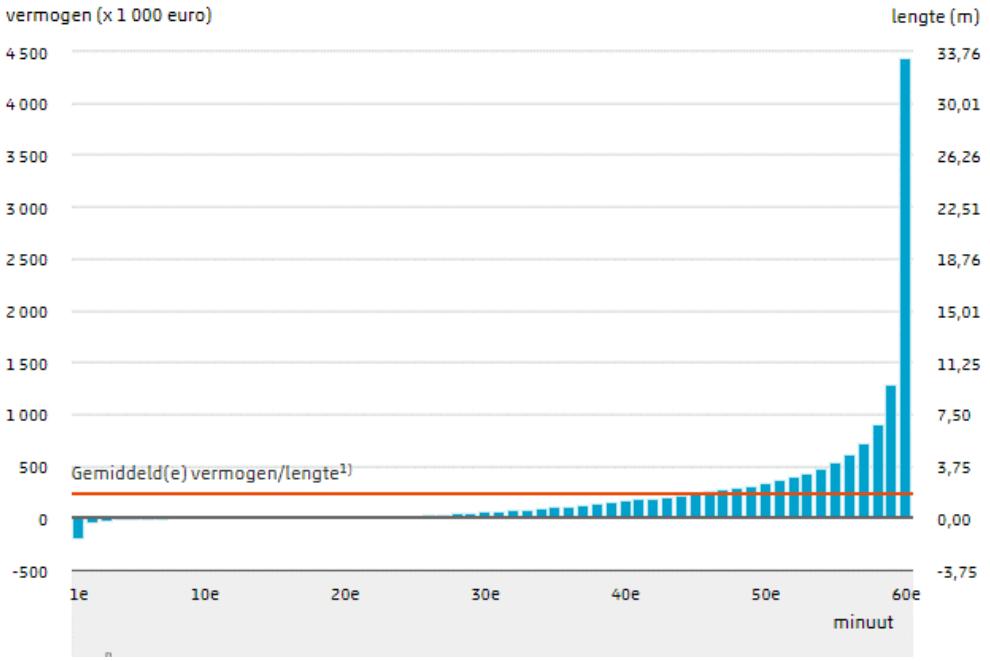


**Figure 103 Pen's parade for Dutch wealth distribution in 2020.** *Note: The average height/wealth owned is 1,74/231.000 euros. The left y-axis represents wealth size in thousands and the right y-axis represents the height in meters. The x-axis represents time in minutes. This figure has been obtained from* **(CBS, 2021)**

| minimaal noodzakelijke kosten | |
|---|---|
| huur[a] | 443 |
| gas | 60 |
| elektriciteit | 20 |
| water | 9 |
| telefoon, televisie en internet | 54 |
| verzekeringen[b] | 45 |
| contributies en abonnementen | 2 |
| vervoer | 14 |
| kleding en schoenen | 56 |
| inventaris | 74 |
| onderhoud huis en tuin | 24 |
| voeding | 201 |
| was- en schoonmaakartikelen | 6 |
| persoonlijke verzorging | 21 |
| diversen | 10 |
| **totaal minimaal noodzakelijke kosten** | **1039** |

| additioneel pakket sociale participatie en ontspanning | |
|---|---|
| contributies en abonnementen | 18,5 |
| bezoek ontvangen | 19,5 |
| op bezoek gaan | 5,5 |
| vakantie/uitgaan | 39 |
| vervoer | 13,5 |
| **totaal sociale participatie** | **96** |

**Figure 104 Indexation of reference budget for poverty boundary for the Netherlands in 2017.** *Note: Left list indicates the poverty budget and the right list indicates the supplementary level. This figure has been obtained from* **(Sociaal en Cultureel Planbureau, 2019)**.

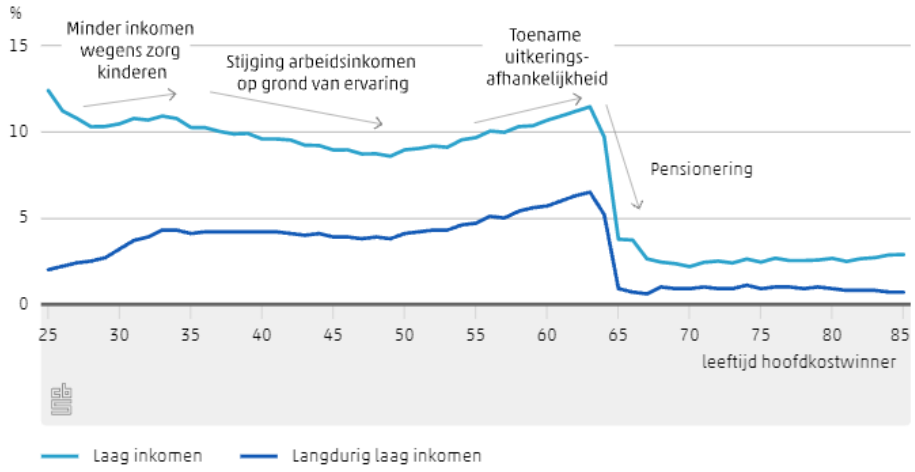


**Figure 105 Risk of being in poverty according to age.** *Note: This figure has been obtained from* **(CBS, 2019)**

## 5.3 Economic inequality

Salverda et al. (2013) found that inequality has risen within the Netherlands by 14% between 1977 and 2011. The top 10% now earns 27% of the total income whereas this was 19% earlier, which has mostly been the effect of households earning higher incomes due to the rise in female labour force participation. This rise mostly occurred between 1985 and 1990, which coincided with an increase from 8 to 13.5% of the households living in poverty. However, Salverda et al. (2013) state that this rise in inequality severely underestimates what is occurring with inequality, the deciles at the extreme (which are being weighed less heavily with the Gini index) are having more severe changes. The top-bottom decile ratio showed a 78% increase in inequality (Salverda, Haas, de Graaf-zijl, Lancee, & Notten, 2013), as shown earlier in Figure 102. While inequality was potentially viewed as of lesser importance, the corona pandemic brought significant change to the perspective as indicated by the following quote from Kim Putters, director of the SCP.

> *"We weten al heel erg lang dat de kansenongelijkheid in ons land groot is, dat de verschillen tussen groepen groot zijn. Maar twee jaar coronacrisis heeft ze veel meer zichtbaar gemaakt."* – K. Putters (NOS, 2022)

### Income inequality

In the framework it has been found that income inequality was related to five aspects: 1. Financialization, 2. Technology, 3. Globalization, 4. Welfare state, and 5. Labour bargaining.

#### *Financialization*

Bezemer (2021) states that financialization is on a high rise in the Netherlands which causes income inequality. This is exemplified by the finance to GDP ratio in which the Netherlands ranks 4$^{th}$ according to the World Input-Output Database (of the 29 recorded countries). But also, by the income gained from wealth (through financialization) in non-financial companies rising from 28% in 1995 to 94% in 2019, or by the private debt rising from 162% in 1990 of GDP to 262% in 2020. According to Bezemer (2021), this caused reduced productivity growth, drain of talent towards finance, reduced R&D, and a

shift in debt allocation. As a result, low-incomes in the Netherlands have suffered from stunted growth.

### *Technology*

According to Smid (2015) technology is influencing the job market in the Netherlands which has negative consequences on income inequality. He explains that the Netherland (and other countries) suffer from job polarization, i.e., increased wages in low- and high-income jobs at the cost of middle income, as shown in Figure 106. This is a consequence of improvements in technology (specifically ICT) and can be explained by using the Routine Biased Technical Change (RBTC) model, put forward by Autor et al. (2003). The essence of the model is that technology is especially capable of replacing routine jobs. In this paradigm, ICT is the motor which can perform cognitive routine tasks, e.g., accounting, logistic planning, and other administrative tasks, which are typical middle-income jobs. This leaves non-routine jobs, with both high and low cognitive input, on the job market (routine, low-cognitive jobs, e.g., assembly-line jobs, already have been replaced by mechanization) which are characterised as low- and high-income jobs (Smid, 2015).

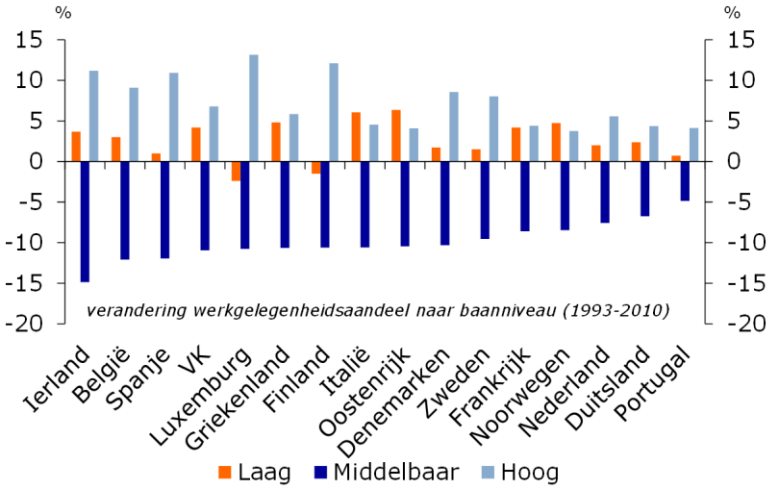


**Figure 106 Relative changes in job offers for low-, middle-, and high-income jobs.** *Note: Change in job offering between the period 1993-2010. Orange indicates low-income jobs, blue indicates middle-income jobs, and light blue indicates high-income jobs. Countries are (from left to right), Ireland, Belgium, Spain, United Kingdom, Luxembourg, Greece, Finland, Italy, Austria, Denmark, Sweden, France, Norway, Netherlands, Germany, and Portugal. This figure has been obtained from* **(Smid, 2015)**

### *Globalization*

According to Smid (2015), globalization (offshoring) is affecting income inequality by repressing low-income jobs. This occurs through intensified competition with low-income labourers from other countries. He notes that this stands in contrast to high-income jobs that are enabled to improve their conditions due to improved demand. In short, his narrative echoes the Stolper-Samuelson theorem explained earlier. These conclusions are also agreed upon by the CPB (Euwals & Meijerink, 2018), noticing that globalization causes increased gross income differences. Although the CPB estimates that income effects of globalization are lower within the Netherlands as compared to other

European countries, they still advocate thorough research on the matter as it could cause negative effects on the economic, social, and cultural domains. However, they note that the ability to combat the effects of globalization is potentially limited as globalization itself cannot be managed.

### *Welfare state*

Kremer et al. (2014) state that the size of the welfare state is reducing which causes a change in the requirements of the citizens which impacts low socioeconomic positions more severely. This is caused by the fact that in the past members of society did not have to save wealth for potential problems occurring in life as the social security system plus state-supplied pension would suffice for their needs. Due to reducing welfare state expenses, the security system is directed towards self-supplied investments. For example, the educational system is leaning more heavily on supplementary shadow education as noted earlier, or the increase in own-risk policy for health care from 150 euros in 2008 to 385 euros in 2017 (Verkaik, 2017). As such, the combination of the reducing welfare state combined with the (current) lack of wealth by a large group of the population, but more prominently by the low socioeconomic positions, causes that opportunity differences occurring in the domain of human capital development enable an increase in income inequality (Kremer, Bovens, Schrijvers, & Went, 2014).

The WRR (2006) concludes that the solution should be to revise the historical welfare state, focused on care and social insurance, into an enabling state or social investment state, focused on unifying society and improving living standards. In short, this would entail a more rigorous policy into human capital development, both in early life as a student as well as when being an employee, and applying a policy promoting life-long learning, e.g., enabling human capital investment without perquisites, instead of a restitution policy, e.g., necessity to meet a prerequisite before being able to apply for a benefit.

### *Labour bargaining*

De Beer and Keune (2018) showed that the influence of trade unions on the labour market is decreasing caused (partly) by their waning number of members. The CBS (2019) reported that the number of trade union members has been decreasing since 2009 with the third-largest decrease ever recorded in 2019, i.e., 101.000 members. Moreover, they show that of all non-members, about half are not considering enrolling for a trade union. De Beer & Keune (2018) believe that a part of the issue of trade unions lies in the free-rider problem where Dutch inhabitants gain profit from the work of trade unions without the necessity to join them. In their view innovation to the "poldermodel", i.e., the bargaining of collective agreements between trade unions, corporations, and government, should be pursued.

Nonetheless, De Beer and Keune (2018) narrate that the ability to claim advantageous collective agreements by trade unions has been reduced and corporations are more apt in finding favourable conditions. Moreover, there are even corporations who are retracting from the collective agreement system and are creating their own (decentralised, firm level) contracts. They connect these processes to limited growth in productivity, limited social innovation, increase wage gaps, reduced social security, and destabilizing influence of increasing job market flexibility going on since the 2000s.

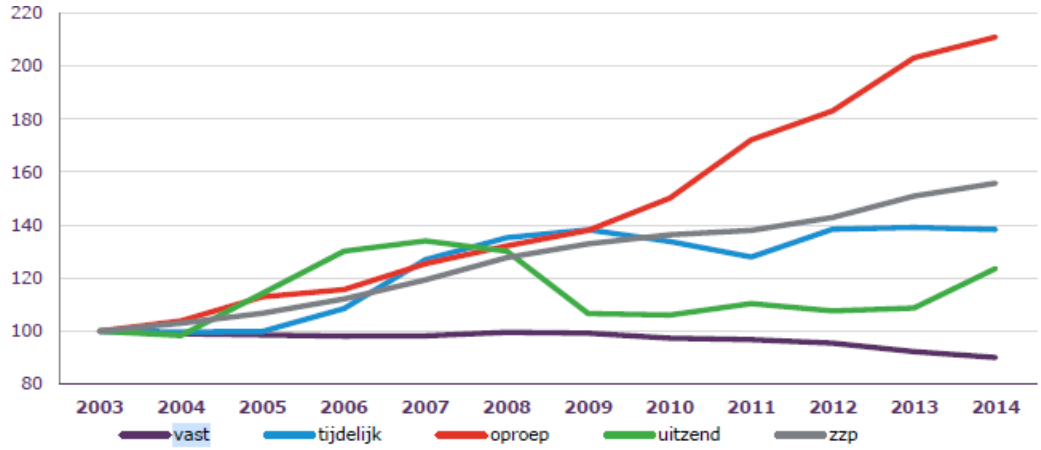


**Figure 107 Trend in type of contracts within the Netherlands between 2003-2014.** *Note: All contracts have been normalized at 100 in 2003. Purple is fixed contract, blue is temporary contract, red is on-call contract, green is detachment contract, and grey is self-employed. Results are based upon the article's author using data from the CBS. This figure has been obtained from* **(UWV, 2015)**

Problematic to the rise in flex contracts, as shown in Figure 107, is their negative prospects in the labour market (UWV, 2015). This is exemplified by the increased odds to fall into unemployment and reduced odds of gaining a fixed contract for employees with a flex contract. The latter effect has even become stronger in the past years. This is exemplified by the fact that it takes about 10-15 years before 80% of the flex contracts are turned into a fixed contract while in the past this took 6-10 years. The UWV (2015) notes that, even though flex contracts are on the rise, fixed contracts are the preferred type of contract, but employees seem unable to get their hands on those types of contracts.

Not only the trade unions are of importance, but also the government plays a role in the labour bargaining process through their policy setting. In the most recent coalition agreement called "Omzien naar elkaar, vooruitkijken naar de toekomst" proposals have been made to improve the labour market. These policies include improving social security, increasing the minimum wage by 7.5% (reaching 10.90 euros per hour), reducing the difference between flex and fixed contracts, and simplifying the tax & benefits system (Rijksoverheid, sd).

However, the commission 'Regulering van Werk' (2020) notes that policy drafting is difficult as it is subjected to political influences. They highlight that inconsistency causes ineffective progress and the inability to bring lasting change to the system. In the current situation, they mention that a large group of people are in structural problems which is primarily a consequence of the laws and regulations made by the government itself. It has been warned by the OECD that the current developments are causing differences in the labour market (and consequential opportunity) which is close to the point of no return causing definitive problems within society (OECD, 2019).

The commission created five cornerstones which are needed to be fixed (Commissie Regulering van Werk, 2020): 1. The flexibility of employees to change work should be based within companies and not between companies. This would increase the durable labour relations and would increase the incentive to invest in human capital. This in turn would create the ability for companies and employees to enable innovation and increased productivity. 2. Reducing the various forms of contract types to three, i.e., employees, self-employed workers (independents), and temp workers, and clarifying the differences between these types of contracts. In general, the effort should be that the factual employer

also becomes the judicial employer which causes that the collective labour agreements of the factual employer will be of effect which removes the abuse of self-employed workers (independents) and temp workers. 3. Enhancing the capabilities of individuals to keep investing in their human capital throughout their career independent of the labour contract. This enables employees to switch between jobs and retain work even though their physical and mental status changes or advancements in the labour market cause lay off in their fields. 4. Fiscal treatment of self-employed workers (independents) and employees should be aligned. In the current system, independents need to contribute less to the social security system causing a discrepancy in contributions within the labour market. This causes that they have an advantage in the labour market by having higher access to labour, but also causes less social security. These gaps should be lessened. 5. Creating an inclusive and activating labour market policy. Too many individuals are absent from the labour market for a prolonged period of time. There should be more tailored incentives and assistance for these individuals.

## Wealth inequality

In the framework, it has been found that wealth inequality was related to four aspects: 1. Income inequality, 2. Wealth transfers, 3. Real estate, and 4. Financialization.

### *Income inequality*

Ter Rele & Voogt (2016) analysed the interaction between income and wealth inequality by relating it to consumption inequality, i.e., the ability to consume goods and services. Interestingly, the interaction between income and wealth becomes more prominent with increasing age, as shown in Figure 108. They find that income and wealth are positively correlated, i.e., a correlation coefficient of 0.47, and when including both income and wealth the consumption inequality increases from 0.248 to 0.305. Yet again, the influence of wealth on consumption increases with increasing age, as shown in Figure 109.

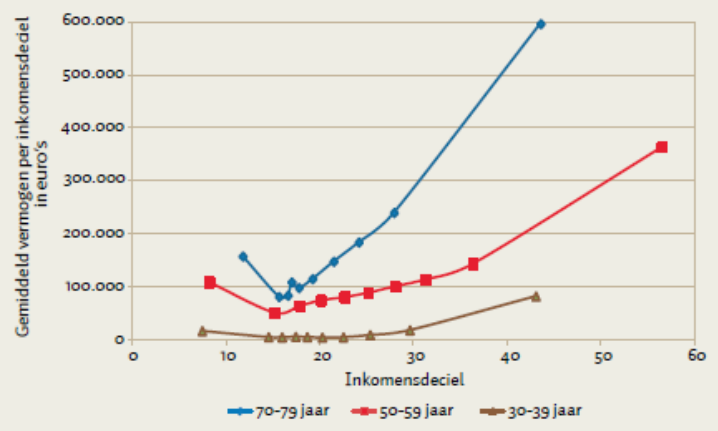


**Figure 108 The correlation between income decile and owned average wealth owned.** *Note: This figure has been obtained from* (Ter Rele & Voogt, 2016)

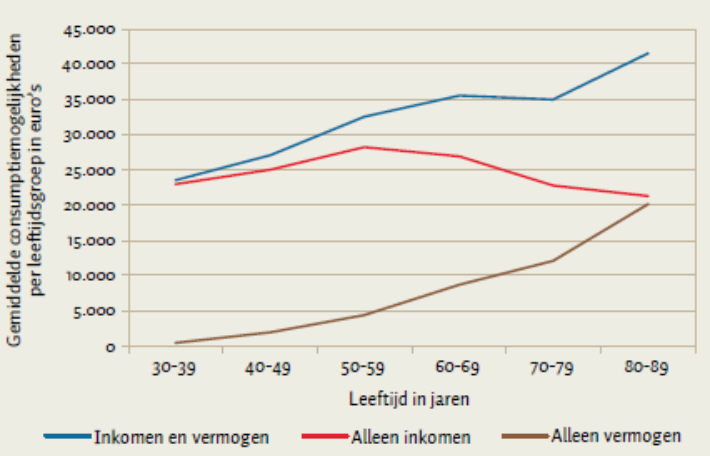


**Figure 109 The average consumption possibilities per age group.** *Note: This figure has been obtained from* (Ter Rele & Voogt, 2016)

### *Wealth transfers*

It is estimated that about 40% of all wealth in the Netherland originates from inheritances. Moreover, due to the rise in wealth inequality, the projections for the future are that this will increase even further. For example, the wealth owned by people older than 65 rose from 350 billion in 2006 to 500 billion in 2017. Moreover, due to the large and sudden decline in the number of children per woman, as shown in Figure 110, and it being below 2, a further concentration of wealth is to be expected in the near future. Using a rough estimate of 80 years of life expectancy, this concentrating effect will happen after 2050 (Ministerie van Financiën, 2020).

However, when reviewing the effect of in vivo transfers and bequests, the CBS (2019) concluded that they are reducing wealth inequality even though the transfers are highly unequal, as shown in Figure 111. This is caused by the fact that the relative amount of wealth received through transfers decreases with increasing wealth deciles. Moreover, the transfers are also occurring from richer to poorer people which also gives an equalizing effect (Groot, Lever, & Möhlman, 2019). The important remark to be made is that the analysis consists of only 8 years, thus evaluating short-term effects. As of now, there is no report concerning the long-term effect of wealth transfers. Moreover, the current demography and wealth distribution in society can cause a different outcome than is to be expected several decades from now.

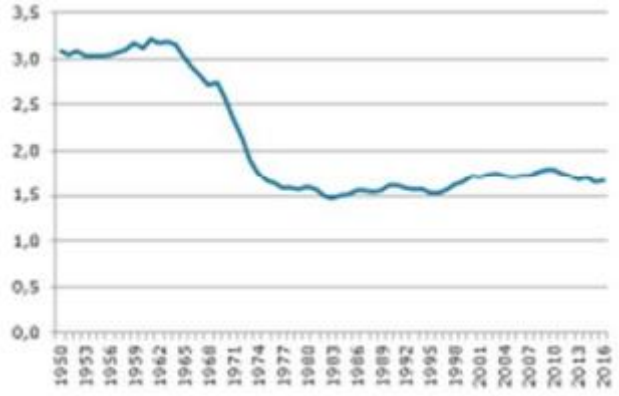


**Figure 110 Number of children per woman between 1950-2016.** *Note: This figure has been obtained from* **(Ministerie van Financiën, 2020)**

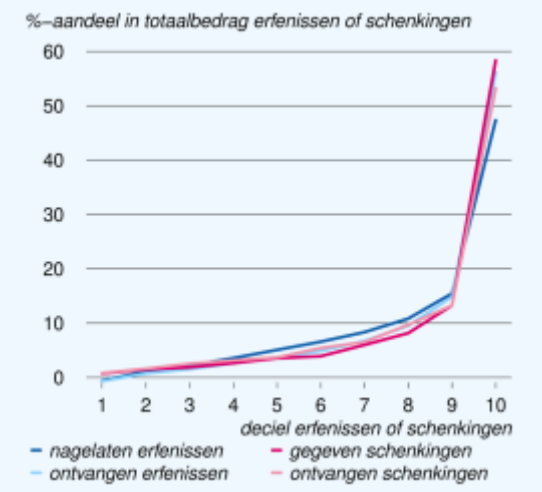


**Figure 111 Distribution of wealth transfers in 2015.** *Note: The results are based upon the article's author's calculation using CBS-micro data. This figure has been obtained from* **(Groot, Lever, & Möhlman, 2019)**

### *Real estate*

As shown by Wind (2017), real estate plays an important part in the wealth owned within the Netherlands. It is encompassing more than half of all wealth owned, and up to the 9th decile accounts for 80% of all wealth owned within that decile. According to him, the dominance of real estate in wealth inequality is in part caused by the policy design of the government. For example, it actively chose to support private real estate ownership. Although it succeeded in increasing ownership among various socioeconomic strata in society, the financial gains of real estate owners have primarily accrued by the early entrants (before governmental liberalization of the market) and those of high socioeconomic position. Partly this is caused by larger access to the real estate market enabling the rich to find high return rate assets, but also due to the necessity of people in a relatively low socioeconomic position to use their financial gains as income supplement and not for purchasing real estate (Wind, 2017).

Overall, Wind (2017) finds that the real estate market is causing segregation between real estate owners versus renters, low and high socioeconomic positions, and causing spatial segregation. He states that the solution should be found in re-regulating the mortgage market, pointing at the past "Swedish model" which existed out of regulated and subsidized social democratic housing. The reason to advocate such a system is caused by the notion that after the "system switch" towards a deregulated market-based system in the early 1990s in Sweden, the housing market became stratified and overwhelmed with inequality issues (Blackwell, 2021). According to Wind (2017), the issues of a market-based system and the real estate boom can be correlated to the profitability of (mostly) untaxed financial gains. By taxing these gains, the ability of investors to enter the market for financial reasons would significantly be reduced and this would curb the growth in real estate prices. Also, it is advised to enhance social inclusion in neighbourhoods to increase the average value of real estate by upward effects of richer residents. This would have the effect that small house owners would incur profits which would else stay out of their reach. Pivotally, Wind agrees that inequality in the real estate market is not a simple adaptation of a single policy, but requires integration of labour market-, spatial

planning, fiscal policy, and housing policy (Wind, 2017). This is a returning issue within this thesis, integration of various factors is required to bring about the desired outcome.

### *Financialization*

Bezemer (2021) states that financialization has strongly increased wealth inequality since 1995 and has partly been mediated by the real estate market. The CPB (Ciurila, Nicoleta; Kramer, Bert; Luginbuhl, Rob; Smid, Bert;, 2021) notes similar trends, where the policy favourability pressures wealth towards the real estate market. Problematic to real estate is that it is illiquid which poses vulnerability to economic cycles. In a downturn, the households have limited opportunity to convert their illiquid wealth to aid their consumption causing a consumption market which responds more strongly to the economy. Overall, André (2018) found that financialization causes to split society more strongly between those who own real estate and those who do not. Moreover, real estate ownership is also correlated to reduced demand for redistribution. The hypothesis is that real estate owners have increased investment opportunities, e.g., buying off mortgages, and can use their real estate wealth as social security which leads to less demand for social security coming from the government. In essence, real estate promotes the self-reliance of households causing them to want less interference from the government.

## Mobility

In the framework it has been found that mobility was related to three aspects: 1. Stratification, 2. Real estate, and 3. Income inequality.

### *Stratification*

Tolsma & Wolbers (2010) find that the Netherlands experiences a reduction in social mobility. This is exemplified by the reduction in inter-generational mobility between parents and children. They explain that this is a consequence of increased educational levels which has caused social congestion at the top. As there is an oversupply of high-level educated individuals, the value of a diploma decreased which caused a decrease in relative social mobility for children who obtained the same educational level as their parents. Moreover, diploma inflation causes a potential increase in the importance of social origins instead of educational performance which further limits social mobility (Tolsma & Wolbers, 2010). Salverda et al. (2013) showed similar findings, noting that intergenerational mobility is less dependent on education causing a heightened value of socioeconomic position which can be transferred between generations.

### *Real estate*

The reports involving the interaction between real estate and economic mobility are limited, but there are indications that the real estate market is causing social inequality. Boelhouwer (Boelhouwer, 2020) explains that the current explosive Dutch real estate market is causing segregation by creating poor and rich neighbourhoods. Moreover, due to the strict requirements of the social renting market, it is almost only accessible to unemployed people causing social segregation in that market. As such, it can be noted that at least in spatial and social considerations there is potentially increased inequality.

### *Income inequality*

Salverda et al. (2013) show that there is reasonable mobility in the middle-income group, but mobility does become lower at the far ends of the distribution. In essence, when born into the richest or poorest quintile the odds are roughly 1/3rd of staying within that income group, as shown in Figure 112. Of interest is that the educational intergenerational mobility has steadily been decreasing for men, where upward mobility was the norm before 1970, this reduced to 50% attaining upward mobility in the period 1970-1984. Important to note is that diploma inflation has steadily been increasing after 1984 as noted earlier in this thesis. As such, it could be suspected that the downward trend in educational intergenerational mobility continues and Dutch income distribution is becoming stratified.

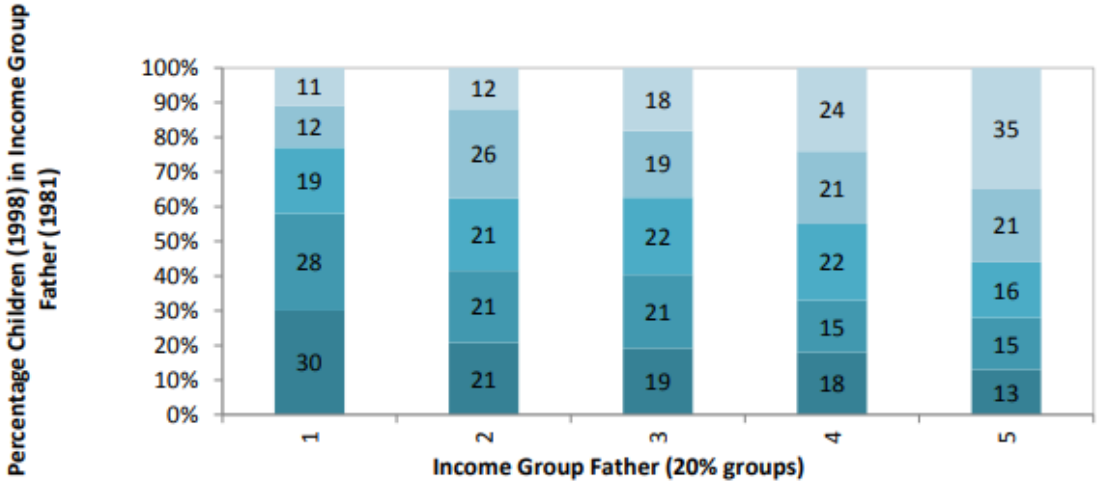


**Figure 112 Correlation between income of the father and child.** *Note: Income has been divided over quintile groups with on the left of the X-axis the lowest quintile and on the right the highest quintile of the father's income. On the Y-axis the son's income has been represented, with the darkest blue indicating the lowest quintile and lightest blue indicating the highest quintile group. The data represents the inter-generational mobility between 1981-1998 and has been obtained from the CBS Welvaartsverdeling from 2000. This figure has been obtained from* **(Salverda, Haas, de Graaf-zijl, Lancee, & Notten, 2013)**.

## 5.4 Redistribution policy

The Dutch government receives 300 billion euros in tax revenue with the top three revenue sources being: 1. Income tax, 2. VAT, and 3. Social security contribution, as shown in Figure 113. 61% of the tax revenue is used to pay for the welfare state, e.g., social security, health, and education, 21% paid to public services, e.g., police, defence, roads, and municipal and provincial expenses, and 11% paid to governmental expenses, e.g., foreign relations and interest paid on debts (Ministerie van Financiën, 2020). As a result of the tax & benefits system, the high pre-distribution income inequality, i.e., Gini-coefficient of 0.57, shifts to one of the lowest after-distribution income inequalities, i.e., Gini-coefficient of 0.33. However, the redistribution largely occurs through the pension system, i.e., the 46,5% redistributed Gini index value can be decomposed as 28,3% pension funds, 6% social security, and 12,3% tax and benefits (Kremer, Went, & Bovens, 2014). This limits the ability of inter-personal transfer as state pensions are largely self-financed, i.e., 68% of the pension is self-financed which largely exceeds the 32% of transfers from rich to poor. Roughly 64% of the total benefits package (WW+AO+AIW+

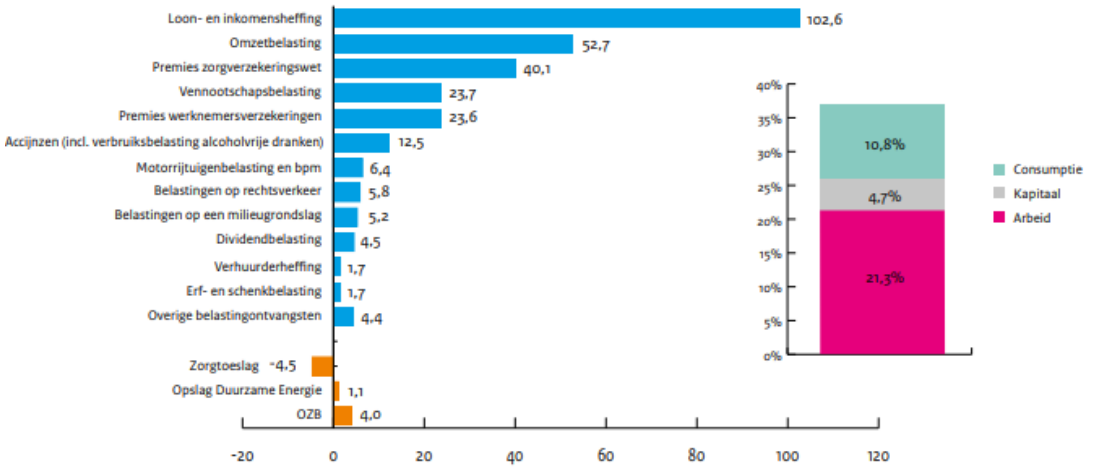


**Figure 113 The amount of received taxes in absolute value (left) and relative to GDP (right) for the Netherlands in 2018.** *Note: The left graph indicates the size of the separate entities in billions. The right graph indicates the relative size to GDP. This figure has been obtained from* **(Ministerie van Financiën, 2020)**

social assistance) is self-financed (Waaijers & Lever, 2013), which is relatively close to the 74% of self-financed benefits in Denmark (Bovenberg, Hansen, & Sorensen, 2008). In general, the result of the dominant function of the pension system causes that within the population between 15-65 years old redistribution has been relatively limited (Caminada, Been, Goudswaard, & de Graaf-Zijl, 2014; Hoff, Vrooman, Iedema, Boelhouwer, & Kullberg, 2021).

To gain a grasp of the effects of the taxes & benefits, Koot & Gielen (2019) made an efficient analysis of the benefits, shown in Figure 114. They find that "algemene heffingskorting" is the most impactful benefit, reducing the Gini coefficient by 11,7%, but relative to its cost this measure is vastly outcompeted by rent assistance which is three times as effective. When comparing the effects of benefits and taxes they find that the income tax is slightly less effective in lowering inequality when compared to health care benefits or rent assistance benefits (4% versus 4,3% and 4,9% on the Gini coefficient respectively).

The Ministry of Finance (2020) has found seven different issues which need to be tackled with policy: 1. Heightened tax pressure on labour income, 2. Tax system depletion of flexibility, 3. The emergence of flex and platform economy, 4. Inequality in average tax

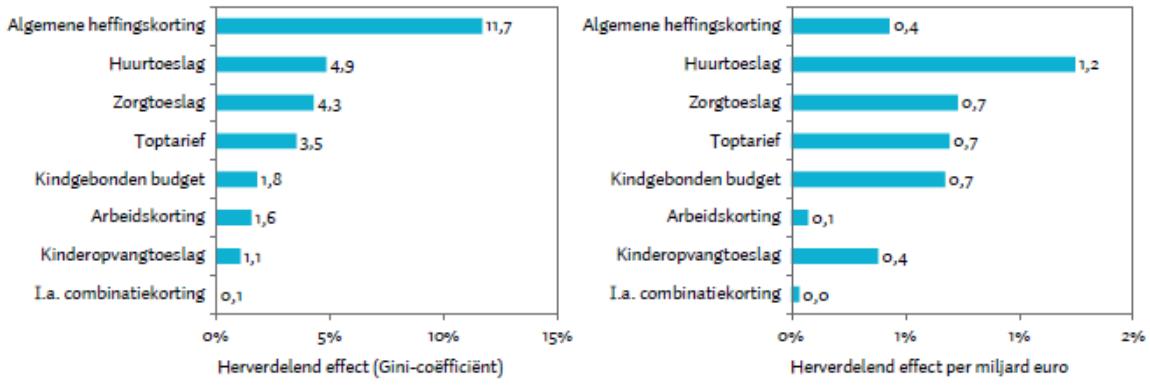


**Figure 114 Redistribution effects of various benefits within the Netherlands** *Note: The left panel indicates the redistribution effect with the costs (in billions) of the benefit next to the bar. The right panel indicates the redistribution effect per 1 billion investments. The results are based upon the article's author's calculations using the MIMOSI simulation model. This figure has been obtained from* **(Koot & Gielen, 2019)**

rate among wealth, 5. Difficulties in taxing profit of international companies, 6. Lack of discounting climate and health damages in tax pricing, and 7. Decrease in effectiveness of the national tax system.

The issues of the tax system also resonate with the benefit system as it causes increased complexity due to the increased use of tax reliefs for the poor to compensate for an overly complex system. However, the use of a wide variety of exemptions causes issues with cashing the reliefs which hinder the efficiency of the system. In sum, the Ministry of Finance is faced with a complex interaction between taxes and benefits which is strongly limiting the opportunities for enhancing redistribution (Ministerie van Financiën, 2020). These problems with the tax & benefits system are in no sense new. As noted by Cnossen & Jacobs (2019), reforms were already advised since 2010 and have been advised many times over in different reports. In essence, they state that the non-neutral, non-transparent, and overly complex tax system should be transformed into a tax system favouring neutrality, purpose, simplicity, and transparency.

> *"Tot slot, in het leven zijn twee dingen zeker: de dood en belastingen. Aan de dood kunnen economen weinig doen, maar aan de belastingen wel."* – S. Cnossen & B. Jacobs (2019, p. 16)

## Taxes & Benefits

In the framework, it has been found that taxes & benefits are related to five aspects: 1. Inequality of income, 2. Inequality of wealth, 3. Wealth transfer, 4. Undocumented inequality, 5. Labour bargaining, and 6. Public perception.

### *Income inequality*

According to Cnossen & Jacobs (2019), the Dutch tax system is non-neutral and not transparent which causes increased tax avoidance and evasion and increased surveillance costs. The current system of taxes & benefits is a matter of increased circulation to fix problems which are caused by the system itself. Indicative for this issue is the fact that almost 60% of Dutch households receive benefits (which can be significant amounts even for the upper quintiles, as shown in Figure 115) while simultaneously also paying taxes. When reviewed next to the tax system, of which the Ministry of Finance

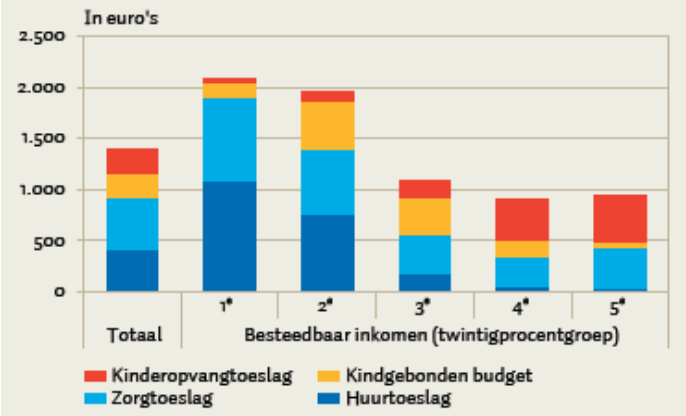


**Figure 115 Average benefits per household decile** *Note: Y-axis represents the yearly average amount in 2015, the X-axis represents the household income quintiles with on the left the overall average. The (preliminary) data has been obtained from the CBS Inkomensstatistiek. This figure has been obtained from* **(Bos, 2017)**

(Ministerie van Financien, 2020) found that only 8 of the total 104 tax policy measures are deemed to be effective and have a genuine purpose within the system (Ministerie van Financien, 2020), it can be stated that the redistributive abilities of the tax & benefits have become overly complex.

Even more so, the tax system has come to the outer extent to which redistribution is possible. In a report of the government, it has been found that lower incomes are paying close to zero tax causing that further distribution in the lower segment is only possible through benefits as opportunities through the tax system have been exhausted (Commissie Draagkracht, 2021). In general, there is a call (if not a cry out) for a tax system which is simple, transparent, neutral, and effective (Cnossen & Jacobs, 2019), echoing similar desires as the Mirrlees review (discussed earlier).

The CPB (van Essen, Leenders, Lejour, Möhlmann, & Rabaté, 2022) states that the tax system is working favourably towards higher wages. For example, the top 0,01%'s average tax rate on income incurs is only half of the average tax rate of the third decile group, i.e. 21% versus 46% respectively, as shown in Figure 116. In summary, the CPB states that the trend in the incurred average tax rates are caused by three effects: 1. increased tax rates in the lower segment by the loss of benefits, 2. the reduced tax rates in the upper segment due to favourable tax rates on capital income (dominating in higher incomes) and regressive nature of the social security contribution, and 3. the regressive shape of consumption tax (in relation to income) (van Essen, Leenders, Lejour, Möhlmann, & Rabaté, 2022).

However, the opportunity to alter the effect of the consumption tax on inequality is rather limited. In general, the focus of the consumption tax should be on simplicity and neutrality as currently the Dutch system is ill-conceived and is overly complex, causing undesired disruption to the economic system (Cnossen, 2019). As such, in agreement with the works of Mirrlees, Cnossen (2019) concludes that the Dutch consumption tax should implement a single VAT rate (set somewhere between the lower and normal VAT rate).

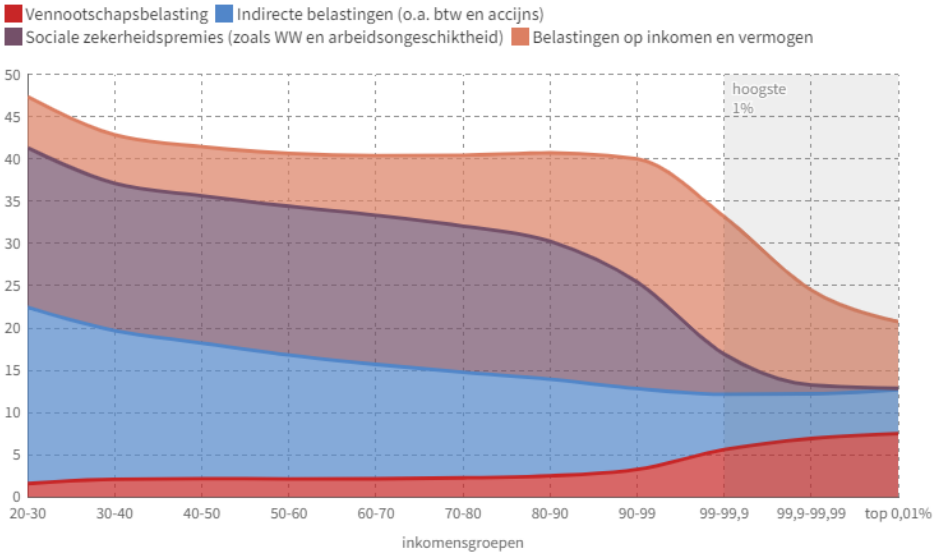


**Figure 116 The average effective tax rate per income decile within the Netherlands.** *Note: Data has been retrieved from the CPB and concerns income data from 2016. Red indicates corporate income tax, blue indicates VAT, purple indicates social security tax, and orange indicates income & capital tax. This figure has been obtained from* **(NRC, 2022)**

Moreover, it would be advised to enlarge the scope of the VAT, e.g., including governmental institutions, schools, health care, real estate, and the financial sector. These inclusions would coincide with the removal of transaction taxes, e.g., reverting real estate transaction tax into a VAT based upon the added value of the real estate. Overall, such adaption would remove the ability to create equality through the consumption tax. It should be noted though that these are difficult to implement as, e.g., European Union laws prohibit VAT on governmental institutions. However, one would strive for a simpler consumption tax system as it would cause welfare gains for society and decreases the costs of regulations (Cnossen, 2019).

Concerning excise taxes, Cnossen (2019) notes that while excise taxes are regressive in nature (similar to the VAT), it should not lead to the false conclusion that increased excise rates are to be avoided. Efficient law-making could create a solution for those with addiction or a vital necessity of certain excise-taxed goods or services. However, the excise should not be seen as the golden solution to various issues, echoing the Mirrlees review. For example, negative externalities such as fireworks and plastic usage are not to be reimbursed using excise taxes (Cnossen, 2019). In sum, VAT and excise taxes are to be used in the regulation of wanted/unwanted behaviour but should not be used in the form of regulation of inequality.

While the consumption tax has limited possibilities to improve inequality, there are significant opportunities to improve the position of the lower income deciles who are experiencing elevated effective tax rates due to loss of benefits. At first, there is a concern about the complexity of the benefits system causing limited understanding by its users. The CPB (Berkhout, Bosch, & Koot, 2019) found that only a small minority of individuals receiving benefits are receiving the right amount of benefit and that 10-15% of the benefits are not claimed. Problematic to these issues is that according to the WRR (2017) they are dependent on mental capacity and require adequate plans and the ability to make the "right" decisions. However, those struggling to make the "right" decision, are also those who are suffering from difficult problems and financial issues. In short, those who are making mistakes are also those who need the system the most (WRR, 2017). The complexity of the benefits system has been acknowledged by The Ministry of Finance (Ministerie van Financien, 2020) which desires to integrate taxes & benefits into a single policy.

The efficiency to integrate benefits could already prove to be an important improvement. According to Koot & Gielen (2019), this is partly caused by the high complexity of the benefits caused by the fragmented number of benefits with each having its own design and being dependent on different parameters. For example, the rent assistance benefit measures wealth differently when compared to the child support assistance. As such, a potential solution would be to unify the rent assistance, health assistance, child support, and the algemene heffinskorting, into one benefit. With such a change, the redistributive effect of these benefits is reduced by 0,1% Gini points while significantly reducing the administrative complexity[16]. However, this would leave the most important redistributive benefits, i.e., WLZ, bijstand, and sick leave assistance, as shown in Figure 117, out of the scope of improvements. Moreover, it should be noted that

[16] The amount of benefit given would be calculated using the following formula: *Benefit household* = 80% × *rent* + €980 × *# childrens* + €3.130 × *single parent* + 73% × *health costs* − 29% × *means-tested income*

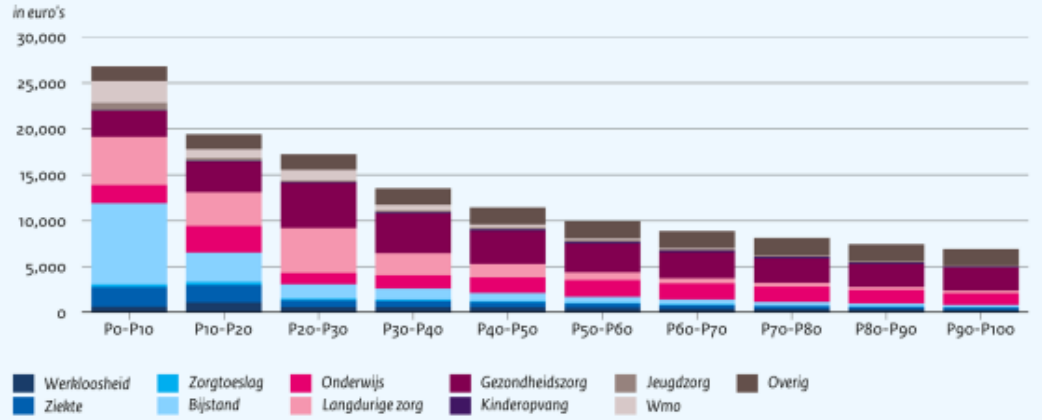


**Figure 117 Government expenses in 2016 per income decile per benefit type.** *Note: The x-axis indicates the government expenses in euros per year and on the y-axis the income deciles. The legend indicates the following: dark blue, unemployment benefits; blue, sick leave benefits; light blue, health care benefits; lightest blue, social assistance benefit; pink, education; light pink, long-term health care benefit; purple, health care; dark purple, day care; brown, youth care; light brown, social support benefits; dark brown, other benefits. This figure has been obtained from* **(van Essen, Leenders, Lejour, Möhlmann, & Rabaté, 2022)**

according to the CPB in-kind transfers are relatively of the largest importance when reviewing redistribution (van Essen, Leenders, Lejour, Möhlmann, & Rabaté, 2022), as shown in Figure 118.

As a last notion, Salverda (2014) state that selective policy causes that specific type of households/individuals are receiving disadvantages, such as single households, but Kremer et al. (2014) is also highlighting that "ZZP'ers" (self-employed workers) are falling behind. In general, this is a consequence of the government favouring dual-income households and fixed contract workers (Cnossen & Jacobs, Inleiding, 2019). These concerns are not new, since the conception of the current benefits system in 2007 it has already been criticized continuously for the same problems again, and again, and again (Ministerie van Financiën, 2020).

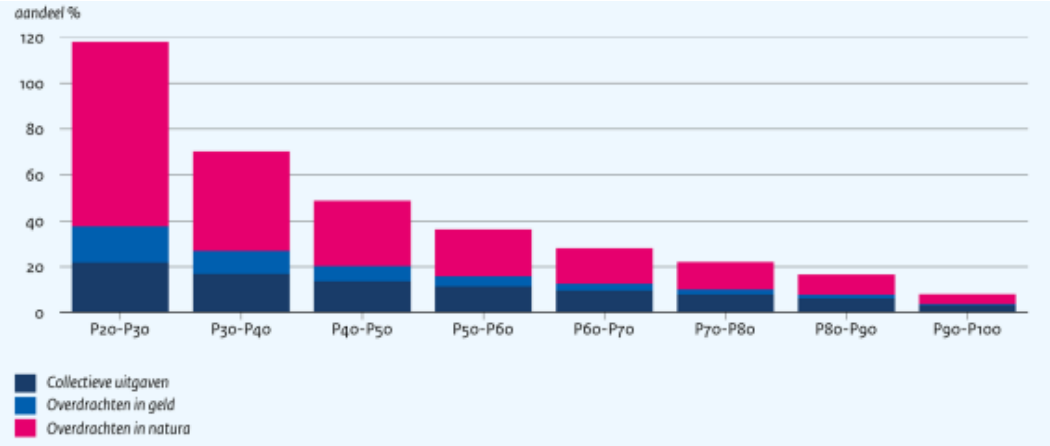


**Figure 118 Government expenses in 2016 relative to the income per income decile** *Note: Dark blue indicates, collective expenses, blue indicates in-cash benefit transfers, and pink indicates in-kind benefit transfers. This figure has been obtained from* **(van Essen, Leenders, Lejour, Möhlmann, & Rabaté, 2022)**

### *Wealth inequality*

When reviewing the wealth tax policy, it is found that the Netherlands incurs low (implicit) tax rates on income from wealth when compared to other EU countries (Jacobs, 2019), as shown in Figure 119. However, it is important to note that the Dutch wealth

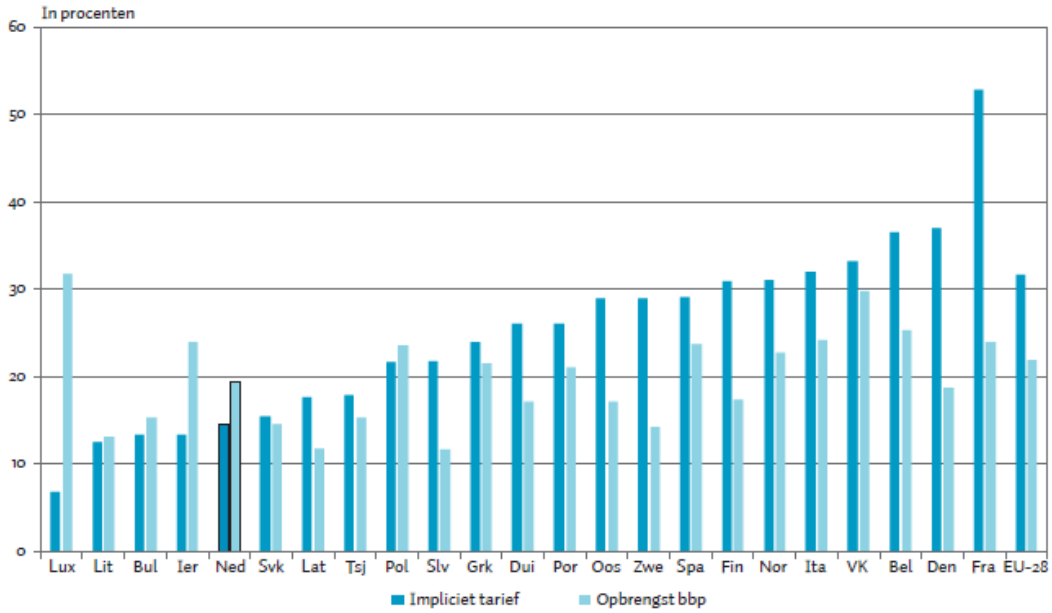


**Figure 119 The effective tax rate on income from wealth and the relative contribution of wealth tax compared to total tax revenue.** *Note: Blue bar indicates the effective tax rate calculated as total capital income tax revenue divided by the total capital income. Light blue indicates the relative amount of wealth income tax compared to the total tax revenue. EU-28 indicates the average of all EU countries plus Norway. This figure has been obtained from* **(Jacobs, 2019)**

income tax in practice functions as a wealth tax as it taxes a standard rate of return on capital, i.e., it assumes a normal rate of return on wealth (Rijksoverheid, 2019)[17].

Moreover, Jacobs (2019) states that the Dutch tax system is a large complex network of varying tax rates on income from wealth with little economic logic behind it. The net effect of the current system pushes wealth towards real estate and pensions. The size of these subsidies is rather enormous, in total 35 billion euros of tax revenue is forgone[18] which equates roughly to the total expenditure of the government on education, i.e., 38,5 billion. Problematic to these types of assets, i.e., real estate and pensions, is that they are (highly) illiquid. This causes a negative effect on the ability of households to compensate for economic shocks, especially if it would concern a collapse of the real estate market.

In general, Jacobs (2019) advocates a single tax rate on capital income which is broad, including dividends, rents, and capital gains. This would also entail removing the tax on financial transactions, such as the "overdrachtsbelasting", as it disrupts the economic system. Interestingly, he also proposes to tax unrealised capital gains as this would avoid the offset of selling assets which have capital gains, which is also being mentioned in the new proposal of the government (Rijksoverheid, 2022)).

However, Kremer et al. (2014) also state that the tax & benefits system, more specifically the welfare state, is contributing to the wealth inequality within the Netherlands. This interaction occurs because the state supplies security of income during

[17] Currently large overhauls are being made to the tax system which assumed a tax on the normal return rate as the 'Hoge Raad' ruled the tax to be unlawful. The current vision is to tax the real return rate on income from capital. However, the design is yet to be drafted and has not been finished at the moment of writing this thesis (Rijksoverheid, 2022).

[18] These results were calculated by the article's author. Jacobs (2019) hypothetically taxed real estate like savings and investments, and implemented similar tax on income rates before and after retirement.

retirement with a state-supplied pension. Moreover, the social security system also supplies a safety net for those who become unemployed or incur health issues during life. Due to these systems, there is no necessity to accumulate wealth to provide security during daring times. This mainly causes that the lower deciles will not accumulate wealth leading to stronger inequalities.

### *Wealth transfer*

In the Netherlands, wealth transfers are incurred by the acceptor of the wealth with equal tax rates for in vivo and inheritance tax rates. The marginal tax rate is trenched over two discs for the amount of wealth transferred and is trenched in two discs by the closeness of relation, favouring partners and 1st-degree relatives with a lower rate as opposed to further distanced relation. Moreover, the wealth transfer system also uses exemptions for both inheritances and in vivo transfers. For inheritance, the exemption is 661.328 euros for partners, 20.946 for children and grandchildren, and 2.208 euros for all other inheritance recipients. In the regard to in vivo gifts, there is a yearly exemption of 5.515 euros for children and 2.208 euros for other recipients. There is also a once-in-a-lifetime in vivo transfer exemption of 103.643 euros but earmarked to be used in 3 years for real estate expenditure, i.e., the "jubel ton" (Ministerie van Financien, 2020).

The Ministry of Finance (Ministerie van Financien, 2020) narrates a bird's eye view perspective with 17.5 billion flowing through inheritance transfers (in 2016) of which 9.1 billion euros of inheritance incurred taxation (in 2015) which generated 1.5 billion in tax revenue. The average tax rates in 2015 were 11.8% for inheritance, 6.4% for in vivo gifts, and 1.1% for company succession. Moreover, the Dutch demographics result in inheritances being received at an average age of 50 years, as they note, way past the window when financial aid is required. This is partly compensated by using in vivo gifts at an earlier stage and also right before death, as shown in Figure 120. When reviewing inequality, the Ministry of Finance (2020) explains that the current birth rate per woman (~1.7) will result in a strong concentrating effect of wealth transfer in the future.

According to Van Gilst et al. (2008), wealth transfers incur too low tax rates and a significant rise could (read should) be applied. In part, this is because just over half of the

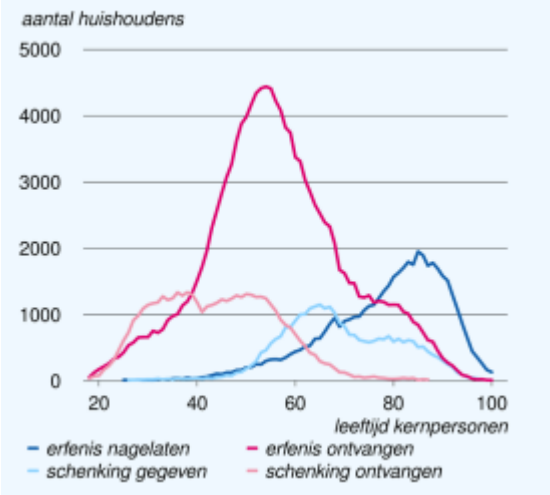


**Figure 120 Relation between age and number of received wealth transfers.** *Note: The results are based upon the article's author's calculation using CBS-micro data. This figure has been obtained from* **(CBS, 2019)**

inheritance transfers are accidental which, from an economical perspective, can incur high tax rates. Moreover, the difference in wealth transfer tax of 10% and the standard VAT rate of 21% causes economic inconsistencies. However, they acknowledge that the decision-making occurs within the political arena which is subjected to political arguments. Also, De Kam & Caminada (de Kam & Caminada, 2010) note that there are four (main) reasons to increase the wealth transfer tax: 1. It's a limited opportunity to target wealth inequality, 2. Acceptability as the acceptor has provided zero input for the (expected) gained wealth, i.e., windfall gain, 3. Limited economic disruption due to savings being uncorrelated to expected wealth transfer to the acceptors, and 4. The gained tax revenue can be used to relieve tax on labour. The advantages of increased wealth transfer tax rates have been acknowledged by the Ministry of Finance (Ministerie van Financien, 2020), but the Ministry states that the narrative is complicated and the negative perception in society is leading to limited political support to enforce such taxes.

### *Undocumented inequality*

Besides the earlier noted untaxed wealth, there is also an issue of undocumented inequality which limits the ability to supply appropriate funding for the low-income group. For example, a new occurrence is the existence of individuals with income but without housing, i.e., economically homeless individuals. Problematic to this group is that it is composed of people with a wide variety of different problems who are (partly) invisible to the government. This is because they either fail to ask for assistance (as they have some sort of financial resources) or when they apply for assistance, they are not being registered as the requested aid is small which leads to an overestimation of their self-reliance. Due to the mismatch in what is known and what is being offered, economically homeless individuals are receiving inefficient aid. The severity of the issue mainly revolves that the economic homeless are now falling off the track causing deepened impoverishment while their problematic issues can be resolved with small assistance when tackled early (Lorkeers, van der Velden, & 't Hooft, 2021).

Besides being unaware of the people requiring aid, there is also a possibility of misjudging the required assistance needed by individuals. Another exemplary case of this is that the social assistance for homeless people is reduced compared to people with housing. Social assistance consists of 70% of the minimum wage, however, when a person is homeless, this amount of social assistance is reduced to 50% of the minimum wage. Problematic with this reduction is that it is based on the false presumption that homeless people have lower costs of living as they do not have to pay for housing expenses. However, people without housing have increased transportation costs and increased turnover of owned items due to loss, theft, and degradation caused by their homeless situation (Brendel, 2020). In general, there are indications that the government is not always able to adequately identify those in need nor to properly estimate their required (basic) needs.

### *Labour bargaining*

The commission "Regulering van Werk" (Commissie Regulering van Werk, 2020) noted that the differences in job contracts lead to differences in the qualification for various benefits. For example, flex workers are experiencing negative consequences in their social security based on their contract type. Low incomes with flexible contracts are often dependent on social benefits. However, due to their varying income, there is limited

consistency in their demand for social support which leads to income instability (Commissie Draagkracht, 2021). For example, a change in employment status (occurring more frequently with flex workers) can put benefits to a (temporary) halt because it takes time for the state to define the new level of benefits in accordance with the changed employment status. This halt in benefits causes a loss of an important source of income, which is causing financial issues for them in the meanwhile. Moreover, as shown by the "Toeslagenaffaire", the reliance on the benefits system can be destructive for families when wrongly applied, with the report being called "Ongekend onrecht" (Parlementaire ondervragingscommissie Kinderopvangtoeslag, 2020). In most recent events it has even come to the point where the government openly acknowledged that institutionalized racism within the Belastingsdienst negatively impacted households with low-income, single-income, and non-Western ethnicities (Rijksoverheid, 2022).

The commission "Regulering van Werk" (Commissie Regulering van Werk, 2020) concluded that the current labour market laws and regulations are not supporting investment into human capital adequately. For example, they note that the budgets aimed at activating the labour market have been cut in half and municipalities have been cut by 2/3rd. Moreover, the unemployment benefits are first supplied by the UWV but after two years this is supplied by the municipality. This transition causes problems as the two institutes have different operating policies causing inconsistencies and unclarity for the benefit receiving individual (Commissie Regulering van Werk, 2020). In general, the reintegration of employees into the labour market has seen reduced support from the government.

### *Public perception*

Blauw (Blauw Research, 2020) performed a panel research, commissioned by the Ministry of Finance, among 1020 individuals regarding the perception of taxes. They found that taxes are considered to be a civilian's duty and there is discontent with tax fraud (76% find this intolerable). This is in contrast to tax avoidance, which is considered more to be a fair game (40% find this intolerable while 32% accept it). However, tax filings are also considered to be difficult and a third of the population uses some form of aid in the declaration while only 18% do tax declaration on their own accord. The low number of own declarations is caused by the perception that the tax system is difficult, especially the "heffingskorting" and the "aftrek voor zorgkosten" are considered to be difficult tax regulations.

Regarding the perception of benefits, there is shame and denial of the individuals who are filling for the benefits, exemplified by the targeted renewable packages which caused shame by its targeted audience (NRC, 2022). But also, there are frequent stories concerning people who have large debts (and require benefits) who are unwilling to be quoted by their full name due to the shame of their debt burden (NRC, 2022). Further aggravation to the negative perception is the difficulty during the filling process. This requires a large number of declaration files and justification papers of the used benefits which frequently requires aid from others to help during the process. This can be as simple as needing to ask others to print the required files as (due to lack of funds) they do not own a printer. The tension between the necessity of requiring aid in filing for benefits and the perceived shame of requiring benefits (causing to attempt to hide benefit claims) causes lowered effectiveness of the benefits themselves (NRC, 2022).

## 5.5 Crises

While I did not evaluate crises or economic shocks during this thesis, I am aware that they can potentially impact parameters within the conceptual framework and affect economic inequality. Therefore, the goal of this particular section is to gain preliminary indications of whether crises or economic shocks can have such an effect. I will do so by reviewing case examples, i.e, the corona crisis and the Ukraine war. These crises have (had) a significant impact on economies worldwide in recent history by causing large shifts in the labour markets and employment, and in food and energy prices. As these events have the potential to impact various social classes differently, they can (negatively) impact economic inequality.

However, I will refrain from extensive research regarding crises as this would lead to requiring to determine the definition of a "crisis" which could potentially prove to be difficult. Moreover, it could well be that there are various types of crises which are having different impacts. For example, one could make a distinction by determining the corona crisis as a health-related crisis while the Ukraine war could be determined as an international market-related crisis. It is unclear whether such a distinction would be of value to the model. As I am (mainly) interested in the functioning of the application of the conceptual framework, this would be too time-consuming and outside of the scope of analysis.

### *Corona Pandemic*

SEO (ter Weel, Bussink, & Vervliet, 2021) concludes that the corona pandemic had a significantly larger negative impact on individuals from low educational levels. In short, they conclude that job opportunities were already favouring higher educated individuals before the corona crisis, but this became aggravated during and (shortly) after the corona crisis, as shown in Figure 121. The CBS (CBS, 2021) made a similar finding, showing that in 2020 about 10% of all minimum jobs were lost while only 0,7% of the jobs above minimum wage were lost.

The CBS (Schulenberg, 2022) finds in an evaluation report that the corona crisis had a significant unequal impact on society, hurting the lower incomes more harshly than others. Problematic to the effect was that the financial support given by the government to aid companies, attempting to prevent job losses, mainly protected the fixed contracts which are held by the higher incomes. The lower incomes, having flex contracts, incurred income losses but also had the lowest financial buffers to compensate for this loss. The CPB concludes that the corona crisis made structural problems in the labour market appear and calls for a change, especially mentioning that the job security differences between flex and fixed contracts should be closed.

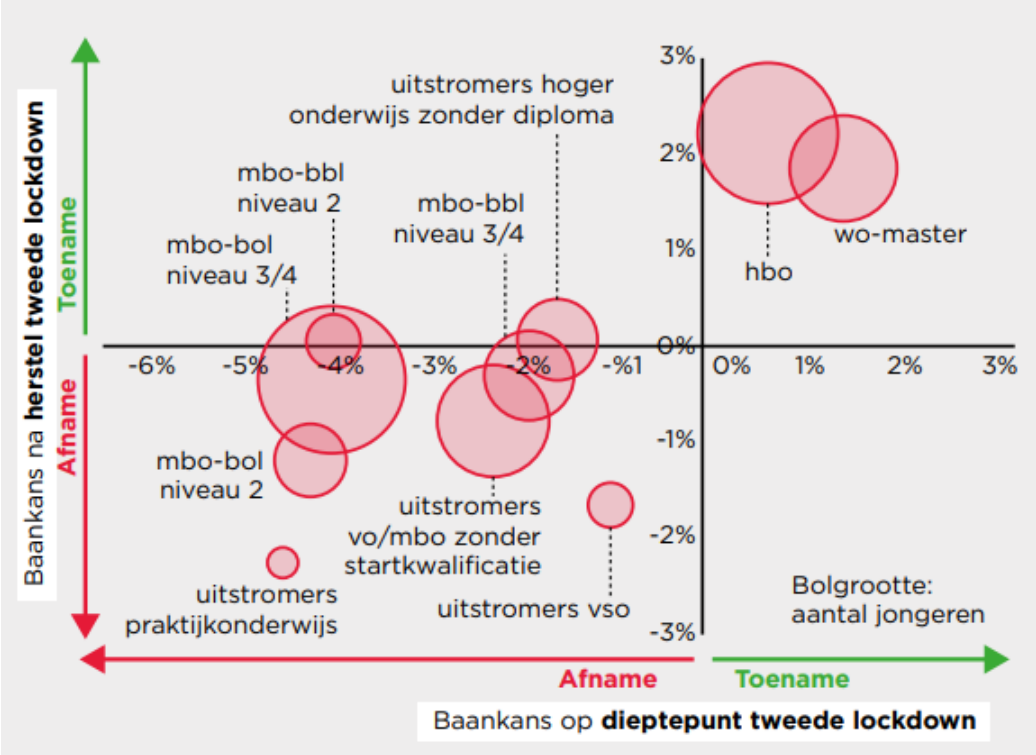


**Figure 121 Job opportunity per educational level during and after the second lockdown in the Netherlands** *Note: This figure has been obtained from* **(ter Weel, Bussink, & Vervliet, 2021)**

Bol (2020) states that corona has aggravated problems which were already present before the corona crisis. They find that inequality of opportunity increased due to the inability of the less fortunate to participate in education by distance, i.e., digital education. Moreover, the students who were dependent on practical education, mostly connected to lower education, were unable to file for internships to receive adequate training. Also, the problematic students got "off the radar" and could not be followed in their progression.

Overall, corona seems to have acted as a catalyst, aggravating already present issues and making them more prominent. On the one hand, this can be seen as an opportunity, as the issues give direction to which issues require a solution. On the other hand, many of the issues seem to have been known before the crisis. As such, they could have been prevented from having a large impact on society by making the system more resilient to impacts.

### *Ukraine war*

As a result of the Ukraine war, fossil fuel and energy prices have risen dramatically causing large increases in energy bills. In an attempt to lower costs for the low- and middle-incomes, attempting to avoid too large economic burdens, the Dutch government decreased taxes on fuel and energy. However, the compensation technique caused that mainly the rich households are being compensated (receiving 660 million euros) instead of the targeted group, i.e., middle incomes (receiving 418 million euros). The poor are being reached even more poorly and were only compensated with 240 million euros. However, there were other plans for the poor (those with income up to 120% of minimum wage) by compensating them with 800 euros in direct fuel and energy benefits (Estrada, 2022).

## 5.6 Reflection on the application of the conceptual framework

In this reflection, a general conclusion will be drafted for the Netherlands and the application of the conceptual framework will be evaluated.

### Conclusion for the Netherlands

The general narrative for economic inequality within the Netherlands is that it is prominently present within society, but the government has applied a large redistributive system. As such, a medium-high market income inequality is reduced to one of the lowest disposable income inequalities worldwide. However, the redistributive system is nearing its maximum in its capabilities to cause redistribution while the market income inequality is potentially increasing further. This opens the risk for the Netherlands that disposable income will become more unequal as increased redistribution will not be possible.

Moreover, next to the income inequality, the Netherlands experiences one of the highest wealth inequalities worldwide. In part, this is caused due to the welfare state which limits the necessity for individuals to accrue wealth to be used during retirement or as social security when unforeseen events happen. While this could (partly) explain the increased size of wealth inequality, the problematic nature mainly resides in the ability of (large) wealth owners to use wealth as a source for income generation. The ability to generate income combined with favourable tax policies causes that the rich incur lower marginal tax rates compared to poorer individuals which conflict with the notion that tax should be paid according to financial capabilities. Moreover, the favourable wealth transfer policies aid in the process of the rich being able to maintain wealth within their bloodline.

This leads to the last issue, opportunity inequality, which is under pressure due to the ability to transfer wealth within bloodlines. This can be correlated to the fact that the highest and lowest income quintiles are experiencing reduced mobility, although the middle-income quintile is experiencing reasonable mobility. However, not only the “hard” financial aspects are impacting the opportunity inequality, but there are also indications of increased issues occurring within the social dimensions. Shadow education has been in an uplift in recent years and is enforcing the ability to convert financial resources into advantageous opportunities. Also, within the democratic field, there are indications that the rich are obtaining favourable policy drafting which is negating the potential to enforce more redistributive policies. However, redistribution would be advised as there are findings that health and economic growth is being negatively impacted by economic inequality.

### Evaluation of application

While the conceptual framework was being applied on the Netherlands, it was found that the model had some noteworthy issues. For example, various interconnections had not been described earlier during the literature review. It is unclear whether these interactions have been missed or whether specific interactions are only occurring within the Netherlands. I will not attempt to research whether the former or latter explanation fits better for each of these new interactions as it would not be of significant added scientific value for this thesis specifically. However, the hiatus does inform us that there are still opportunities to enrich the conceptual framework. It would be advisable to perform more analyses of other countries and gain a better understanding of how the

system, i.e., the conceptual framework, works. The newly found interactions are as follows (within the conceptual model they are indicated by dashed edges):

1. *Real Estate – Wealth Transfers*
2. *Real Estate – Financialization*
3. *Technology – Financialization*
4. *Technology – Economic Growth*
5. *Financial Resources – Opportunity Inequality*
6. *Financial Resources – Climate change*
7. *Financial Resources – Crime*
8. *Education – Health*
9. *Globalization – Undocumented Inequality*
10. *Tax & Benefits- Unawareness*

Next to the finding that various interactions have been "missed", the application also displays that the analysis focuses on singular parameters & interactions. While this is somewhat inherent to how research is performed, i.e., reports & academic literature are written about specific parameters & interactions, it could be of interest to think of procedures which embody the 'system problem' of economic inequality more appropriately. It brings an incentive to create a research method that attempts to bring forth the integration of the various parameters & interactions. At this stage of the thesis, there are no clear indications of how this could be done. Potentially such a perspective will come into view when the conceptual framework has become more "complete" by using systematic reviews to enable to define parameters & interactions more precisely.

Moreover, it is of interest to note that several reports recognize and validate several issues revolving around the specific parameters & interactions but also describe that there is an inability to provide a fitting solution. For example, the current tax & benefits system has already been noted as problematically complex at its conception in 2007 and has not seen any crucial adaptations in the 15 years after. Moreover, shadow education has already been on the rise several years before the corona crisis but, yet again, has not seen any rigorous attempts for a solution in the years after. Even worse, after the corona crisis, the government is implementing large investments which will potentially even strengthen the issue of shadow education in the near future. It can be worthwhile, after having a more "complete" conceptual framework, to gain more in-depth knowledge about hindrances occurring while drafting policies. Quite surely this will be correlated to the notions that they revolve around complex (and potentially wicked) problems, making policy inherently difficult. However, a system perspective could potentially lead to new insights which can aid in resolving potential issues.

Lastly, there are indications that crises are impacting economic inequality. However, this thesis has not been able to rigorously analyse the impact of crises nor whether there are common features among the crises in their impact. There could be potential to create classifications of crises and their common features and how they interact with economic inequality. This review can be done by finding which parameters or interactions are being impacted within the conceptual framework. If consistencies are

found, this could lead to developing a pre-emptive set of actions (or policies) which can be implemented or a pre-emptive set of parameters which need to be reviewed to monitor potential complications while a particular (type of) crisis is occurring.

# 6. Conclusion & Discussion – Framework and policy

At the end of this thesis, it is time to return to the research questions and summarize the answers that were found based on the integrative literature review. After this, the discussion part will consist of a reflection and recommendations. In the reflection, I will discuss the use of the conceptual framework and its limitations and in the recommendations, I will provide potential improvements to the conceptual framework to improve its usage as a reference work.

## 6.1 Conclusion

This thesis has extensively reviewed and analysed economic inequality to find the answer to the main research question.

**How does economic inequality function as a system?**

The main conclusion of this thesis is that economic inequality involves a large array of many parameters which are interconnected to each other by manifold interactions. Based on my analysis, I could identify 26 parameters and 55 inter-connections and visualized this system using a conceptual framework, as shown in Figure 122. [19] For this representation, I used graph theory where the parameters are depicted as nodes and are connected using edges. Based upon the complexity as presented by the

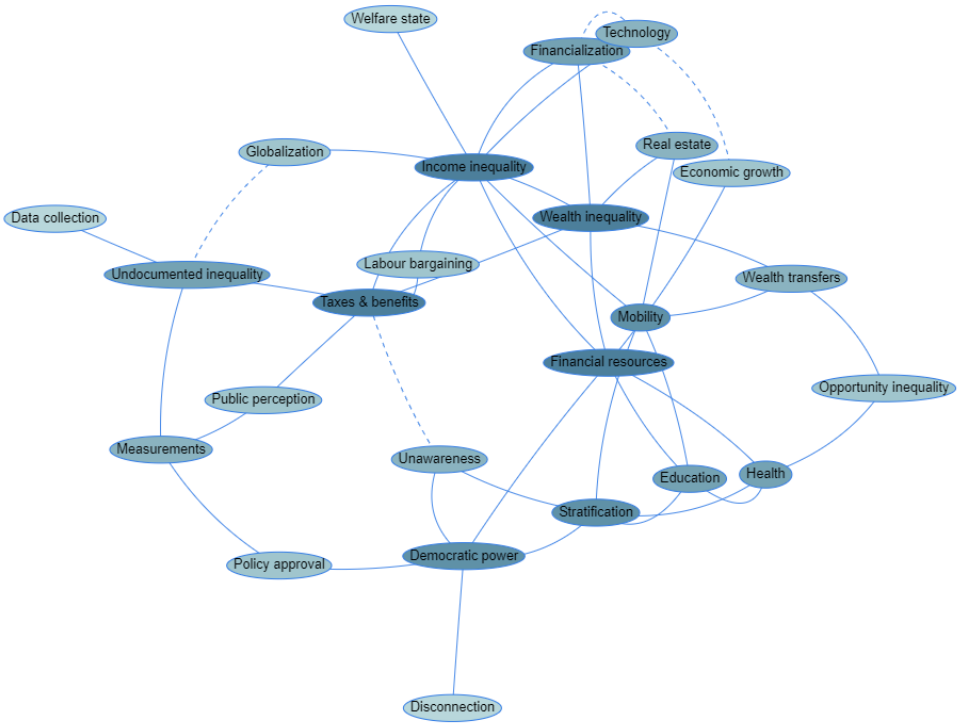


**Figure 122 The conceptual framework synthesized from this thesis' review.** *Note: The shading indicates the number of interactions occurring with other parameters, going from 1 to >5.*

[19] The conceptual model has also been published on the internet. The interactions can be viewed in a web tool that gives information about the nodes and edges. Moreover, one can switch between the generalized concept and the Netherlands. Link: Conceptual framework for economic inequality

conceptual framework, I state that economic inequality should be approached as a systems problem which is influencing the opportunities people have in life and is causing unfair differences.

*Sub question 1: Does economic inequality cause a problem?*

I found that there are significant issues caused by economic inequality, as described in the chapter "Inequality's influences – Are differences bad?". The researched areas were health, democracy, education, and economy. All these areas experienced negative consequences of (growing) economic inequality. Mostly this was related to the notion that social stratification solidifies with increasing economic inequality. This occurs because the rich can use their (increased) financial resource to consolidate their position while the poor experience increased hindrance by the lack of their financial resources.

*Sub question 2: How can economic inequality be quantified?*

There are several options to measure and quantify economic inequality and these have been described in the chapter "Quantifying inequality – How to define inequality?". Three opportunities can be distinguished to measure economic inequality, i.e., tax data, household survey data, and rich lists. Each of these measuring techniques have their specific issues, but they all revolve around the notion that measuring the ends of the distribution, i.e., the rich and poor, is considerably more difficult as opposed to measuring the middle. They all attempt to tackle these issues through correction techniques but keep having inconsistencies and limitations. Therefore, when compiling a database, it is advised to attempt to integrate information from various measuring techniques to obtain a more complete dataset which has these inconsistencies cancelled out.

As to turning measurement into the quantification of economic inequality, four common family types of indicators have been found which are more regularly used in determining the size of economic inequality: 1. Lorenz-curve indicators, 2. Generalized Entropy indicators, 3. Ratio-based indicators, and 4. Poverty-based indicators. Each of these types of indicators have their specific characteristics and limitations. Therefore, I find that it is ill-advised to use indicators individually as this would lead to an incomplete assessment of economic inequality. As such, a better approach would be to use different indicators simultaneously to broaden the scope on economic inequality and improve the assessments made.

*Sub question 3: What is the cause of economic inequality?*

The causation of economic inequality has been discussed in two separate chapters, i.e., "Economic inequality – How does money flow?" and "Redistribution policy – One for all, and all for one?". In the first portion, it has been found that all domains of economic inequality, i.e., income, wealth, and opportunity inequality, are on the rise, but have their specific causation mechanisms. As such, income inequality finds its causation in globalization, technology, financialization, labour market regulation, tax & benefits system, and other government interference in the labour market. Whereas wealth inequality finds its causation through the process of income inequality (an increase in disposable income enhances the opportunity to save), increased income from wealth, and

wealth transfers which can create wealth "dynasties". While opportunity inequality finds its causation in differences in financial resources combined with educational and social background differences (enhanced by stratification of these differences).

In the second portion, it is found that the tax & benefits system is of large importance to redistributing economic inequalities. However, the redistributive effects of the benefits system are roughly three times as large as the redistributive effects of the tax system. As such, the complete system should be envisioned to contain a tax revenue generation portion, i.e., the tax system, and a redistributive portion, i.e., the benefits system. However, to make the tax & benefits system effective it is required to make it operate simply, transparently, neutrally, and efficiently. I find that current systems have not adhered to these requirements. They are often tremendously complex which enables rich individuals to abuse the system in their favour (gaining more financial resources) while the poor experience issues with gaining social security and benefits to accommodate their expenses.

## 6.2 Reflections

In this reflection, I will first provide the contributions made by the conceptual framework and after that I will discuss its limitations.

### Contributions

While performing this research, I have not encountered any conceptual framework or other types of representation which attempt to give a clear overview of the *system* involved in economic inequality. As such, I would state that the conceptual framework provided in this thesis is the first of its kind and provides an opportunity for the field to gain insight into the system of interactions relating to economic inequality. As such, it enables you, the reader, to learn about all the various parameters ('drivers') and interactions involved within the system. Doing so grants the ability to, e.g., gain direction on which parameters need new or improved policy drafting, be warranted for secondary effects, or be informed when engaging in debates and discussions. Overall, this thesis's main function is to act as a reference work for others to be used for their own work when discussing economic inequality.

Besides giving an overview of the field, this thesis makes it clear by reviewing economic inequality as a system that "silver bullet" policies are to be regarded as something of the past. The intrinsic complexity, shown by the conceptual framework, makes it impossible to have a single policy as a solution. I pose that the field requires a broad scope (systems) perspective which incorporates the various aspects when discussing the issues caused by economic inequality or when policies are being drafted. As such, this thesis encourages the field to think about integrative policies and (major) secondary effects.

Moreover, I would state that this thesis shows that the 'solution narrative' should revolve around creating equal opportunity for all (while preventing poverty from occurring). The reason for this is the fact that we have no opportunity to create a policy for the right "amount" of income & wealth equality. I have not found any indication which provides a direction toward an inequality indicator target value, e.g., inequality is at its best at a Gini index of 29.5. This is in contrast to equality of opportunity, on various accounts opportunity inequality is perceived as the culprit behind issues caused by

economic inequality. Problematic to the issue is that financial resources play a pivotal role in gain advantages within the system. As such, one can attempt to either disconnect the ability of financial resources being able to gain an advantage within the system or reduce the financial resources available to the individuals who are using it to gain an advantage. While this narrative is presented in other articles, this thesis is explicit in presenting it from the perspective of the system of economic inequality.

## Limitations

While a large first step in investigating economic inequality as a system has been made, the novelty also creates limitations caused by (unforeseen) issues. I have distinguished these limitations into two separate headings. One of the limitations is the "incompleteness" of the conceptual framework, these limitations can largely be solved by adjusting some of the performed steps in this thesis. The other limitation is caused by the design of the thesis, these limitations cannot be solved by small adjustments but would require a different research method.

### *Incompleteness*

One of the limitations of the conceptual framework is that it is incomplete in its review of the "complete" field of economic inequality. While I attempted to analyse the topic from a broad perspective and present various angles, multiple articles have not been included and topics, theories, and models could have been missed or are known to be missed. For example, the potential correlations between economic inequality and justice & crime or the environment have not been discussed while I found indications that it could be of importance. Moreover, as the search strategy has been limited to topics directly related to economic inequality, interactions between other parameters have not been investigated. For example, there has not been any research on the relation between education and tax evasion & avoidance, but one could hypothesize that more educated individuals are more likely to understand tax rules and, thus, are more able to use loopholes. As such, the research has had a "narrow" frame of investigation causing that interactions have (potentially) been missed.

I restrained from enlarging the literature review which could have increased the scope of the conceptual framework because of three reasons. At first, time limitations caused by the time window in which an MSc thesis should be completed prevented me from "simply" putting more time into creating a larger literature review. Secondly, the thesis already has a considerable size, making it even larger can cause that its impact and narrative becomes diluted. Thirdly, and maybe most importantly, due to the wicked nature of economic inequality, it is impossible to create bounds to the number of parameters and interactions which are involved in the system of economic inequality. As it is impossible to create a boundless conceptual framework, decisions have to be made on which parameters and interactions are to be included and which ones are not.

While the conceptual framework could have been enlarged, I would state that this thesis has been on point in justifying its decisions to support its current size. At the start of every chapter, I provided arguments, based on scientific support, which explained the scope of analysis for that particular domain. As such, I prevented that the inclusions were based on subjective reasons but were objectively supported. Although one could mention that the articles used to support the narrative are of "subjective" inclusion, it would take

a different literature review methodology (a systematic review would prevent subjective inclusion of articles) to tackle this issue. As this thesis was explorative to the field, such a methodology has not been opted for as it would be suboptimal to achieve this thesis' goal. However, while the current size may be logical and supported by scientific literature, the issue of "incompleteness" of the conceptual framework persists. I will provide some possible solutions to this issue in the recommendations section and will mention them as improvements.

### *Design*

Besides the amount of analysed research, the design of the thesis, i.e., an integrative literature review, puts limitations on its potential use. An integrative literature review is perfectly suited to become acquainted with a topic but is limited in its ability to make definitive statements used for explicit policy drafting or conclusive claims on the effects of interactions. Even when the conceptual framework is extended or its analysis is intensified, such statements cannot be made due to its design. The two characteristics which are (mainly) limiting this possibility are: 1. Biases in reviewed data, and 2. Interaction specifications. These limitations would require a different research angle, I will discuss some of these options in the recommendations section and mention them as extensions.

#### 1. Biases in reviewed data

The problem with an integrative literature review is that there is potential for biases in the reviewed literature, either by the researcher himself or the literature available. These problems are not (completely) solved by enlarging the number of included articles as the issues will persist even when a more complete or intense search is being performed. For example, income inequality has the most interactions within the conceptual framework which could lead to a potentially false conclusion that this is the most important parameter.[20] This is caused by the fact that literature is "biased" in its reporting toward income because income inequality has a much larger amount of data which can be analysed. In large part, this data overflow is caused due to rigorous income taxes supplying an enormous amount of data while wealth taxes are only sparsely implemented (as to remember, only four countries have extensive wealth taxes). Therefore, the number of written articles concerning income inequality is simply higher which increases the odds of finding an interaction. The potential literature bias is caused by the methodology used for an integrative literature review. When desiring unbiased literature to provide for founded arguments, then (semi-)systematic literature reviews are required which define their search methodology more rigorously.

#### 2. Interaction specifications

The research methodology is designed to create an overview to find involved parameters and interactions. However, the methodological aim of identifying these

[20] It can be debated whether the highest number of interactions is a suitable parameter to ascertain which parameter is the most "important". One could state that a large number of interactions with weak correlation is of lesser important than a small number of interactions with a strong correlation.

notions leads to the limitation of being unable to provide details about the interactions themselves because it is not the goal of the research design. For example, there are no specifications about the direction of interaction nor whether the interaction between parameters is positively or negatively correlated. Problematic with these issues is that detailed interaction information is dependent on specific conditions. For example, the effect of increased investments in education has different outcomes depending on the type of investment. Investments in primary education tend to improve equality of opportunity while investments in higher education tend to decrease the equality of opportunity. These issues cannot be solved by adding more literature input to the conceptual framework. It would require that the conceptual framework work increase its specification in the analysed topics. However, increasing the specificity of the conceptual framework could also make it less intuitive for interpretation as it would need to account for more detail. The trade-off between detail and interpretability has not been researched within this thesis and, potentially, improvements can be made.

## 6.3 Recommendations

As the provided conceptual framework acts as the first step in the development of a new perspective, there are adaptions which can be made to enhance the quality of the work. I distinguish two types of adaptions, firstly improvements which focus on continuing the current work, and, secondly, extensions which can provide advantages by implanting the conceptual model while using a different perspective.

### Improvements to the conceptual model

I envision improvements can be made through two distinct procedures: 1. Enlarging the scope of the thesis, and 2. Enhancing the quality of analysis. I will explain these improvements in more detail.

#### *Enlarging the scope*

A "simplistic" adaptation to the conceptual framework is increasing the number of reviewed parameters and interactions. However, as economic inequality concerns a wicked problem, it is impossible to include "all" parameters and interactions as there is an undefined number of parameters and interactions. It would therefore be advised to create a scope of which parameters and interactions are to be included and which ones are not. One could attempt to limit the number of inclusions by only including the most "important" parameters and interactions. However, this is a subjective interpretation thus reaching a satisfactory conclusion about what is and what is not important will be difficult. A potential solution to this problem is finding other researchers and other authoritative individuals who as a group discuss which parameters and interactions are to be included. This could also improve the support for the developed conceptual model as multiple individuals are included in the decision-making. Based on the outcomes of the peer group, the conceptual model can be put into scope and further enlargement can be implemented.

Another outside-of-the-box idea would be to review the conceptual framework as a kind of "Wikipedia" platform which can be altered by others and is being reflected upon by a peer group. Such a method would drastically increase the number of available individuals to give input to the conceptual framework. While the input can be increased,

it can be questioned whether the obtained input is of proper quality. Moreover, to gain engagement with individuals who are willing to alter the conceptual model, it would most likely need to have reached a level of completion to where it can already be used for others. At least, I do not envision the possibility where an unfinished model will be completed by others without them having an incentive to do so, e.g., the desire that their work input will be of use to others.

### *Enhancing quality of analysis*

Next to enlarging the conceptual model by adding more parameters and interactions, it is also possible to improve the conceptual model by enhancing the quality of research for the already reviewed parameters and interactions. The current literature review was focused on finding the involved theories and gaining preliminary indications. However, this is not the same as extensively researching a specific parameter or interaction and finding a "definitive" answer to how that parameter or interaction operates. To be able to make such statements, a rigorous analysis is required that reviews specific topics methodologically. This could be achieved by performing systematic literature reviews which has an explicit (unbiased) review method, enabling well-founded conclusions. Moreover, this could also assist in developing founded critiques on various theorems and models. While I attempted to describe such critique by presenting various perspectives on the subject, the nature of an integrative literature review is not suited to be definitively certain of the correctness and consistency of the various theories and models.

## Extensions to the conceptual model

There is also potential to extend the reach of the conceptual framework beyond its current design. The envisioned extensions are: 1. Creating a distinction between economic inequality and poverty, 2. Performing an internal analysis, 3. Using the conceptual framework for policy drafting, and 4. Acknowledging the impact of crises

### *Economic inequality versus poverty*

This thesis focussed on economic inequality and only lightly touched on the topic of poverty. While "solving" economic inequality (envisioned by improving opportunity equality) is seen as an important goal, it does not prevent that people can live in poverty. However, there are ethical and philosophical reasons that would state that poverty is an unwanted occurrence. This leads to the extension that the conceptual framework should make a distinction between economic inequality and poverty. While closely related, there is potential for differences in interaction. This could mean that a new conceptual framework should be made solely for the purpose of analysing poverty. However, as it is unknown whether these differences will occur, it could be more efficient to use the currently developed conceptual framework and make for every parameter & interaction a notion specifically aimed at poverty. Advantageous to such an integrative conceptual framework would be that it could review the concept simultaneously preventing a disconnect between the subjects.

### *Internal analysis*

The conceptual framework could be enhanced by performing an internal evaluation of the framework itself. As noted in the limitations, there is a potential bias in the

incorporated information caused by either bias in the field or by this thesis itself. To be able to ascertain (and potentially correct for) potential biases it is required to analyse included literature, which could be done by creating a concept matrix of the included articles. Another (more rigorous) method would be performing a systematic review which compares the relative quality of the literature review, e.g., by the number of (academic) articles included, between researched parameters & interactions and can give indications about the maturity of the field. Moreover, one could attempt to grade the scientific support for certain interactions, e.g., it is "certain" or "conflicting support", to bring clarity to the importance of an interaction within the conceptual framework. These kinds of extensions can give insights into the foundation of the incorporated information and enhance its quality causing the improved positioning in the field as a reference work.

### *Policy drafting*

When a new policy is desired, it would be recommended to first conduct a systematic review in the field/interaction which is considered to be intervened through policy enactment. After this, indications can be obtained to create specifications for the policy. Once a policy is drafted, the outcomes can (attempted to) be modelled and a decision can be made on whether the policy causes the desired effect. As an example, this thesis found that wealth transfers (and more specifically inheritance) are vital in the progression of wealth inequality. As such interest is obtained to devise a policy for a functional wealth tax. This leads to a systematic review concerning wealth taxes which indicates all the relevant theories, which can act as the founding basis to propose a policy. The drafted policy can subsequently be analysed by the CPB for its envisioned effect, after which its potential enactment can be decided if the modelled outcome equals the intended/desired outcome.

However, one should be aware that there is no possibility to develop a "one-shot" policy which will solve all the problems on its own accord. It would be advised to have a combination of policies which act as a system, strengthening the effectiveness of individual policies through positive interaction. While the current conceptual framework is not able to show whether policies would promote each other effectiveness, it is able to show whether the policies are (most likely) interconnected to each other. In my vision, the knowledge of knowing how policies could interact can lead to follow-up research to avoid policies hindering each other.

Moreover, as found during the review of the Netherlands, policy drafting is complex. It could be of interest to attempt to evaluate common problems which are causing redistributive (or economic inequality negating) policies to be prevented from implementation. However, this could be highly difficult research as policy drafting often revolves around wicked problems causing them to be one of a kind in their drafting procedure. As such, searching for a common problem with a "silver bullet" solution could cause entrapment into similar faulty reasoning as happened with economic inequality in the past. If so, a different type of research could be needed.

### *Crises*

The last extension which could be of support to the conceptual framework would be the review of crises. As found during the review of the Netherlands, crises have an impact on economic inequality by affecting various parameters & interactions within the system.

It is envisioned that it would be worthwhile to create a typology of the different forms of crises which can occur and their common characteristics concerning their impact on economic inequality. When doing so, it can be possible to devise a set of actions, e.g., pre-emptive policies or increased surveillance, which are to be implemented to reduce the negative effects of a crisis. If this could be achieved (partly), then it can lead to the prevention of great losses and go beyond what has been deemed possible when starting to work on this thesis.

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## 8. Appendix A

Description of the ten characteristics of a wicked problem as provided by Rittel & Weber (1973):

*1. No definitive formulation*

The problem of economic inequality can be defined in various manners. For example, it can be investigated by income inequality, wealth inequality, or inequality in access to education, or health care. The description of the problem directly influences the possible solutions. The inherent nature causes that the problem cannot be identified without knowing the possible solutions.

*2. No stopping rule*

There is no quantifiable end goal for economic inequality, i.e., there is no description of when the problem of economic inequality is solved (because there is no agreement on what the "optimal" degree of inequality is).

*3. Solutions are not true/false, but better/worse*

It is not possible to formulate a testable result that can be verified. There are various stakeholders with different interests regarding economic inequality, but none of the stakeholders can state formal rules to judge the correctness of the result. As such, results are only better-worse and never true-false.

*4. Solution cannot be tested*

An implemented policy "solving" economic inequality can never be tested as the effects have trickling-down effects on other parameters. Therefore, the time necessary to reach the complete effect of a solution will be prolonged, if not infinite. Moreover, as policies affect various parameters, which are different for various people and differ over time (the effect can be positive in the short run, but negative in the long run), it is impossible to model the effects.

*5. One-shot operation*

Implemented policies have a lasting effect on society. The effects of an implemented policy cannot be reverted as the people will already have experienced the effects in their life, these experiences are fixed for life. As such, one only has a single opportunity to fix the current problem as the problem changes after the solution has been implemented.

*6. Only a sub-set of all solutions can be identified*

There is no possibility to test if all potential solutions to solving economic inequality have been reviewed. Because the problem cannot be definitively defined, and as such, the solution is also not defined, and there is no formalized set of rules for a potential solution, the potential solutions are based upon own.

*7. Essentially unique*

Economic inequality is unique compared to other problems, but also in its own right. The inequality experienced in various countries differs, but also the economies of various countries differ. There are commonalities in the problem and possible solutions, but it will not be possible to create a 1-on-1 copy of the solution implemented in one country in another country, also because different countries/societies differ in how much inequality they find politically acceptable (e.g., compare the U.S. and the Scandinavian countries).

*8. Symptom of another problem*

A problem is the effect of another problem, which is the effect of another problem and so on, without a natural hierarchy to these problems. For example, it can be stated economic inequality is caused by unequal wage pay, which is caused by differences in education, which is caused by differences in opportunity to obtain an education, which is caused by differences in living conditions, which are caused by economic inequality. It is impossible to create a hierarchy of importance for these issues and, therefore, it should be reviewed as a system's problem requiring taking all parameters into account to attempt to change the system.

*9. The perspective of the analyst determines the solution to the problem*

As it is impossible to state what the most important cause is of the wicked problem, nor have an opportunity to test the importance of causes, the approach of the analyst is the most important determinant to the potential solution of the problem.

*10. No right to be wrong*

The effects of potential policies can be detrimental to individuals causing serious harm to their well-being. Regarding economic inequality, one can state people who stay in poverty, become impoverished, or have a large setback on their living standards, are experiencing negative effects of the policies. One can state that a policymaker cannot risk these conditions as they could be deemed to be unethical.