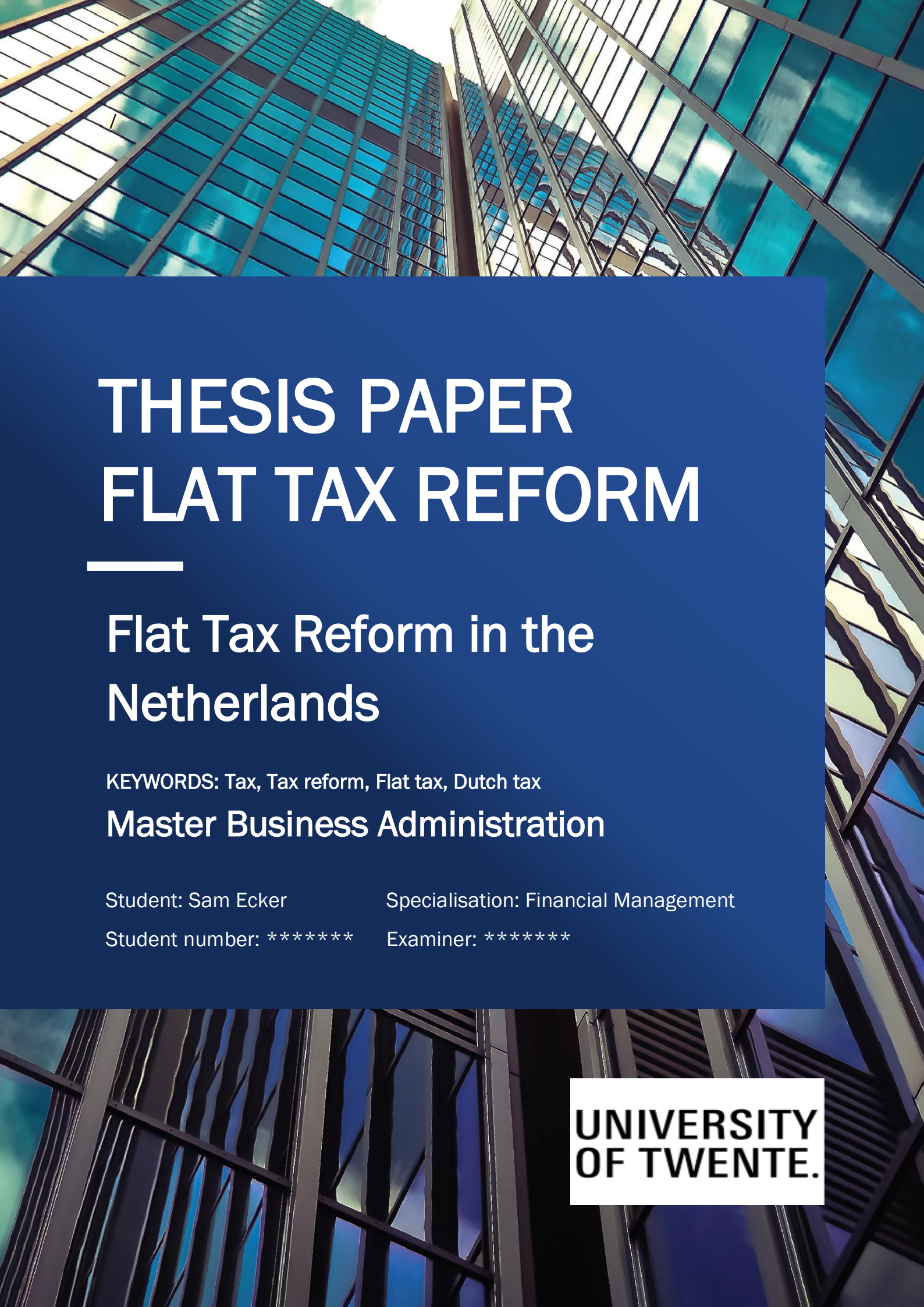

THESIS PAPER FLAT TAX REFORM

Flat Tax Reform in the Netherlands

KEYWORDS: Tax, Tax reform, Flat tax, Dutch tax

Master Business Administration

Student: Sam Ecker
Student number: *******
Specialisation: Financial Management
Examiner: *******

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Flat Tax Reform in the Netherlands

by

Sam Luke Ecker

Industrial Engineering & Management (BSc, Saxion University of Applied Sciences, Enschede)

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Abstract

This paper focuses on a hypothetical flat tax reform in the Netherlands. The aim is to simulate different flat tax rates on different tax bases in order to identify realistic alternatives to the progressive tax system. The aim is to ensure that the tax revenues of the Dutch government remain in line with those of the progressive tax system.

Research question: *'Which variation of the 'flat tax' system could be a realistic alternative to replace the current Dutch 'progressive tax' system?*'

This research is based on optimal tax system theory and provides a framework for analyzing the trade-offs between efficiency and fairness when designing tax systems. The theory aims to identify the optimal marginal tax structure (tax base, tax rate) that achieves fair taxation while minimizing efficiency losses.

The pros and cons of a flat rate tax depend on the situation. These could simplify tax laws and encourage job creation and investment, but they could also be regressive and limit government flexibility. It should be mentioned that the potential advantages and disadvantages of a flat tax system only manifest themselves in certain ways. Reaping the benefits while mitigating the drawbacks therefore requires careful consideration. Progressive taxation has both strengths and weaknesses, and its effectiveness depends on how it is designed and implemented. A progressive tax system can help reduce income inequality and generate government revenue, but it can also have the unintended consequences of hindering economic growth and causing administrative problems.

Critics of flat taxes argue that they are not progressive, meaning that high-income earners pay less in taxes than low-income earners. This can exacerbate income inequality and hit low-income people disproportionately hard. Furthermore, a flat tax system can impose a high tax burden on low-income individuals, making it difficult for them to meet their basic needs and potentially pushing them into poverty.

The concept of negative taxation, proposed by economist Milton Friedman, offers an alternative to traditional welfare programs. Negative taxation is intended to help those whose income falls below a certain threshold, and is not targeted to specific groups. This is unlike Universal Basic Income (UBI), which is available to everyone regardless of income level, and is therefore more expensive. With negative taxation, individuals receive support only if their income is below a threshold and start paying the normal rate of tax once their income is above the threshold.

This work includes a simulation tool that consists of two parts:

Negative tax rate and flat tax rate. There will also be a transition period between the two, during which the tax rate will increase in stages from a negative effective tax rate to a flat rate. The simulation tool allows for different combinations of negative and flat taxes with customizable tax bases and rates. These variants can be compared with the current progressive system.

For the simulations extensive amounts of historical tax revenues are used to give a detailed description of the revenues generated, which tax rates applies on the tax base. This will function as the standard with which the flat tax simulations are compared with the progressive tax system. The tax bases are divided into income levels to compare the relative tax burden of the different income groups. The focus is on post-tax income and the tax rate applied on the pre-tax income, and the distribution of the tax burden on the different income levels. For the negative tax system data from historic subsidies is used, to see if some or all of the income dependent subsidies could be incorporated into a negative tax system that is applied up to a certain threshold. After which the flat tax rate applies in full. The

negative tax system is necessary to prevent a significant increase in relative tax burden on the least wealthy in the Netherlands.

The results from the simulations done in this research paper have been analysed, the following results came out:

- The net income levels are higher at the lowest income levels under the negative tax and flat tax. The negative taxes ensure that the lowest income levels receive extra income, this effect decreases as the income increase. This results in the progressive system having marginally higher net income levels between 13.350 euros and 41.850 euros.
- This results in income levels between 13.350 and 41.850 marginally lose under the negative tax system and flat tax system. Every other income level wins compared to the progressive system.

The answer to the research question *'Which variation of the 'flat tax' system could be a realistic alternative to replace the current Dutch 'progressive tax' system?'* is:

It can be argued that a combination of negative and flat taxes could replace the current progressive system within simulation tools with the included variables. This is because, under similar circumstances, net incomes are fairly close at similar tax rates between the progressive and flat systems. A negative tax means that the new system is more favourable to the lowest income earners, and if the government raises the negative tax rate and tax base, more low-income levels will benefit from it compared to the progressive system. In theory, this would make the new system more "progressive" because it would favour the lowest income groups more that the current progressive system.

In short, the new tax system and its tools will allow governments to minimize the income levels that could lose under a negative and flat taxes when compared to the current progressive system.

However, the results of this paper cannot be said to make the proposed new system a "realistic" alternative. This is mainly because more variables need to be taken into account before a new system can be considered a 'realistic' alternative, and testing a new system requires more up-to-date data with more variables.

Based on the findings in this paper, it can be concluded that the proposed combination of negative tax and flat tax can be viewed as a potential 'realistic' alternative to the current progressive tax system in the Netherlands.

This research and its results are intended as the first step in the process of learning, extending, adapting, and improving new systems so that they become viable alternatives that can be implemented in the real world in the future.

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1 Thesis Introduction

1.1 Introduction

The debate on different flat or progressive tax regimes has received a lot of attention in academia in recent years, after several Eastern European countries have introduced different variants of flat tax regimes (Keen et al., 2008).

For this thesis the focus is on a hypothetical flat tax reform in the Netherlands, the aim is to simulate different flat tax rates on different tax bases to identify realistic alternatives to the progressive tax system. The form or forms of flat-tax system(s) should allow the Dutch government's tax revenues to stay equivalent to the revenues the progressive tax system provides.

The new system has been approached from a right leaning, left leaning and a balanced version of the two. The right leaning perspective has a smaller and less generous negative tax and a lower overall flat tax rate. This means that there is more of a focus on making the tax system as efficient as possible, this is one side of the efficiency/equity trade off. The left leaning perspective has a larger and more generous negative tax. This means that there is a focus on the redistribution of wealth and support of the lower income levels, this is the other side of the efficiency/equity trade off spectrum. In this paper the balanced version of the two perspectives has been used, this version of the negative tax and flat tax model has the most comparable results when looking at the current progressive system used in the Netherlands. The right and left leaning versions can be found in the calculation model attached to this paper.

In order to simulate the left and right leaning perspectives, the following variables have been changed: the size of the income range that is to receive a negative tax, the height of the negative tax rate, size of the income range that is to pay the full flat tax rate, height of the flat tax rate. These changes are interpreted as followed:

Right leaning perspective is considered to have:

- relatively lower tax rate;
- relatively lower negative tax rate;
- slimmer income range that is to receive a negative tax.

Left leaning perspective is considered to have:

- relatively higher tax rate;
- relatively higher negative tax rate;
- the wider income range that is to receive a negative tax.

This gives the following research question:

'Which variation of the 'flat tax' system could be a realistic alternative to replace the current Dutch 'progressive tax' system?'

A 'realistic alternative' for the current Dutch tax system will be defined as followed: The tax revenue generated by the "new" tax system cannot significantly deviate from the revenue of the existing tax system. That also does not severely increase the tax burden on specific groups of the Dutch tax base.

Browning, E. K. & Johnson, W. R. found that the predicament when choosing a tax system is the trade-off between efficiency (the same for everyone) and equity (redistribution of wealth)[1]. A progressive tax system is considered to be more equitable because it lowers the relative tax burden of the less wealthy and increases the tax burden of the wealthiest. While a form of flat tax system is considered to be more efficient and less complex because everyone is paying the same proportional tax rate, which lowers administrative costs (De Mooij, 2008).

Flat tax reform has a risk of increasing the tax burden on the least wealthy & lowest income class, because they are at risk of losing a proportionally larger share of their disposable income compared to higher income levels (Browning & Johnson, 1984). Criteria set for this thesis is that the tax burden cannot significantly increase on any specific income level. Therefore, this thesis also aims to build a social safety net into the tax reform, in the form of a negative tax system. This will allow for a lower tax burden on the lowest income levels up to a certain threshold, after which the normal tax rate applies (Bawden, 1969). This negative tax system will replace specific existing subsidies in the Netherlands which are income dependent.

For the simulations extensive amounts of historical tax revenues are used to give a detailed description of the revenues generated, which tax rates applies on the tax base. This will function as the standard with which the flat tax simulations are compared. The tax bases are divided into nine different income levels to compare the relative tax burden of the different income groups. The focus is on pre-tax income and the tax rate applied on the pre-tax income, and the distribution of the tax burden on the different income levels. For the negative tax system data from historic subsidies is used, to see if some or all of the income dependent subsidies could be incorporated into a negative tax system that is applied up to a certain threshold. After which the flat tax rate applies in full. The negative tax system is necessary to prevent a significant increase in relative tax burden on the least wealthy in the Netherlands.

The research question of this thesis will be successfully answered when one or more forms of a flat tax regime have been divined that meet the criteria set in this thesis. That includes a negative tax system to counter a potential significant increase of the tax burden on the least wealthy.

The new negative tax and flat tax model is approached from three different perspectives (right leaning, left leaning and balanced), to show the readers that this model is flexible and allows to change with the political climate. But it also shows that the model is not a tool that belongs to either side of the political spectrum, there are multiple versions that could work for either side. A larger social safety net with the use of negative taxation, or minimize the social safety net to reduce the overall tax rate. The version of the model that is eventually potentially implemented, is determined by what the Dutch population votes for at that specific moment.

This thesis does not deal with ethical implications that would arise when the Dutch tax system is drastically changed. This thesis instead aims to identify potential flat tax variants that could work from a revenue perspective. The results of the thesis should provide a base or starting point for future discussions on potential tax reform. Ethical implications are a topic that needs its own research paper, to give a more comprehensive view of the potential consequences of drastic tax reform.

[1] Browning, E. K., & Johnson, W. R. (1984). The Trade-Off between Equality and Efficiency. *Journal of Political Economy*, *92*(2), 175–203. http://www.jstor.org/stable/1831382

This thesis topic is relevant because existing tax reform research for the Dutch tax system is over 20 years old in 2023, in that time the tax system has changed multiple times and therefore the literature is in need of more recent research on tax reform in the Netherlands.

2 Systematic Literature Review

2.1 Search Terms & Strategy

The main search terms used to find high quality literature on taxation and specifically flat taxation for this paper are:

- Flat Tax, Taxation, Progressive Tax vs Flat Tax, Negative Tax, Taxes, Dutch Taxes, Tax Structure, Social Security, Tax Benefits, Dutch Social Welfare, Tax Theory, Tax Literature.

The search terms gave a combined 12 thousand results on Scopus and ScienceDirect. To reduce the results the following filters have been used independently:

- TITLE-ABS-KEY("flat tax") AND PUBYEAR > RECENT
- TITLE-ABS-KEY("flat tax" AND "progressive tax") AND MOST-CITED > CITATION

See appendix 2 for all search codes applied.

After using the more specified search codes and removing duplicates, 80+ articles were left. By reading the titles of the articles around 35 where left. The abstracts of the remaining 35 papers were read, which resulted in the list of articles below. These articles were compared to the sources of similar research papers and have often been used as sources in other research. This is except for the research papers about the Dutch tax reform and paper about negative taxes, this is more specific research and thus less likely to be used by others. The following list of literature is about the following main topics: flat taxes in general, Dutch taxes, negative taxes, tax theory and social welfare:

1. Atkinson, A. B., & Stiglitz, J. E. (1980). Lectures on public economics. McGraw-Hill Education.
2. Boadway, R., & Wildasin, D. (1989). Optimal tax design in the presence of externalities: A correction. Journal of Public Economics, 38(3), 359-361.
3. Browning, E. K. (1995). The marginal cost of public funds: Theory and applications. MIT Press.
4. De Mooij, R. A. (2008). Reinventing the Dutch tax-benefit system: Exploring the frontier of the equity-efficiency trade-off.
5. Caminada, K., & Goudswaard, K. (2001). Does a Flat Rate Individual Income Tax Reduce Tax Progressivity? A Simulation for the Netherlands.
6. Friedman, M. (1962). Capitalism and freedom. University of Chicago Press.
7. Mirrlees, J. A. (1971). An exploration in the theory of optimum income taxation. Review of Economic Studies, 38(2), 175-208.
8. Mirrlees, J. A., Adam, S., Besley, T., Blundell, R., Bond, S., Chote, R., ... & Poterba, J. (2011). Tax by design: The Mirrlees review. Oxford University Press.
9. Musgrave, R. A., & Musgrave, P. B. (1989). Public finance in theory and practice. McGraw-Hill Education.
10. Stiglitz, J. E. (1987). Pareto efficient and optimal taxation and the new new welfare economics. Handbook of Public Economics, 2, 991-1042.
11. Stiglitz, J. E. (2012). The price of inequality: How today's divided society endangers our future. W. W. Norton & Company.
12. Bawden, D. (1969). A negative tax experiment for rural areas. *American Statistical Association Proceedings. Washington: American Statis. Assoc*, 157–162.

The list of literature above is central to the research in this paper, together with empirical evidence and data provided by the Dutch government and tax agency provides the literature, empirical data and other data needed. With this data a comprehensive model for a flat taxation in combination with negative taxation simulation in the Netherlands is made.

The list consists of highly cited critically acclaimed papers about flat taxes, progressive taxes and taxation in general, more recent and more updated papers that have included more recent developments in taxation, specific papers about Dutch taxes and tax reform, specific papers about negative taxation. These papers combined provide a comprehensive literature base that this paper contributes to by combining and updating the existing literature and providing a model applied to the Dutch tax system.

2.2 Optimal Tax Theory

The optimal tax theory lays the foundation for this thesis, it provides the framework to analyse the efficiency-equity trade-off that is central to formulating a tax system. The optimal tax theory describes the optimal marginal tax structure (tax base, tax rate) that on paper achieves the most equitable taxation with minimal efficiency losses in the process. The most referred to literature about the optimal tax theory comes from (Diamond & Mirrlees, 2018), (A. B. Atkinson & Stiglitz, 1976) and (Mirrlees, 1976). There are multiple assumptions made with regard to the optimal tax theory and the results of the analysis made, are a logical consequence of the assumptions made in the theory. While there are different opinions about the results that come from the optimal tax theory, the difference in opinion is likely based more on the underlying assumptions made then the results necessarily.

The assumption central to the optimal tax theory is that the government will only tax (or not tax) if the result is more social welfare[2] for the population. This means that the government decides which tax systems (or regimes) to implement based on which one maximizes social welfare for the population. This does mean that the government has a bias towards a more equal distribution of income, because the relative increase in social welfare is higher when income increases for relatively lower income individuals. This results in a preference for redistribution of income (wealth) from rich individuals[3] to poor individuals[4] because this maximizes social welfare up to the point that society supports it. The level of redistribution is determined by the level of social equality society that supports, the government does not increase taxes until equality is achieved as this has an adverse effect on social welfare. Because of the assumption that the government aims to maximize social welfare, the optimal tax theory will always lean towards a non-linear progressive tax system or away from a flatter tax system. Thus, there are multiple proponents of the progressive systems because with the assumptions made in the optimal tax theory, it is more likely to achieve the highest social welfare thru progressive taxation.

However, this thesis paper argues that optimal taxation and desired results have not been achieved with the current progressive system in the Netherlands. For example, the richest people in the Netherlands have never been as wealthy as they are today. Income inequality only increased with the introduction of progressive systems (see figure 1 in paragraph 1.3 for Income Inequality Index). Inefficiencies in redistribution efforts by subsidies and other social programs carry high administrative costs due to the complexity of multiple different subsidies. The complexity of the social subsidies also results in people having a higher net income thru subsidies with a lower salary, compared to working

[2] Social welfare is the sum of the utilities of all individuals in society, the utility of every individual is determined and measured by the sum of scarce commodities that each individual consumes: consumption goods, leisure, environmental quality and so on.

[3] Rich individuals are defined as individuals that have low social marginal utility of income. The (extra) money rich individuals make have less added satisfaction because most or all basic needs are already met to a satisfactory level.

[4] Poor individuals are defined as individuals that have a high social marginal utility of income. The (extra) money poor people make have a high added satisfaction because not all basic needs have been met to a satisfactory level.

more without those subsidies thus discouraging people to earn more. The optimal tax theory also fails to take into account the potential long-term effects of a flat tax system on increased economic growth and thus on social welfare as a whole. Which is has the potential to significantly increase social welfare and could possibly increase social welfare even more in the long term compared to a progressive system. This can be argued because historically it has been economic growth that has lifted most individuals out of poverty not social programmes, social programs make people depended on the government instead of being incentivised to become economically self-sufficient.

2.3 Flat Tax vs Progressive Tax

Firstly an overview of the generally excepted advantages and disadvantages of flat and progressive taxes by (Anthony B Atkinson et al., 1980; Auerbach & Hines, James R, 2002; Browning & Johnson, 1984; Mirrlees, 1976) respectively (the advantages and disadvantages are only realised under specific versions of a flat and progressive tax and are not guaranteed):

Flat taxation:

A flat tax is a tax system in which everyone pays the same percentage regardless of their income. Flat taxes have been introduced in some countries, but they remain the subject of debate among economists and policy makers. The advantages and disadvantages of the flat tax system are as follows:

Advantages:

- **Simplicity:** Flat taxes are easy to understand and easy to implement. Eliminating complex tax laws saves time and resources for both taxpayers and government officials.
- **Justice:** Proponents argue that a flat tax is fairer than a progressive tax system because everyone pays the same percentage of income. This reduces the likelihood of redistribution of income and eliminates the need for complex tax credits and deductions.
- **Inspire work:** A flat tax system can help people work harder and earn more. Because they won't be penalized for their success with a higher tax rate.
- **Promote (private) investment:** A flat tax may be more attractive to investors as it provides a stable tax environment and reduces uncertainty about future tax obligations.
- **Increased Tax compliance:** With a flat tax on all variants of income there is no way to reallocate income towards different forms of income that have a lower tax rate, to decrease the taxes that need to be paid.

Disadvantages:

- **Regressive:** Critics argue that flat taxes are regressive because low-income earners pay a higher percentage of their income in taxes than high-income earners. , can harm the most vulnerable people in society.
- **(Potential) Loss of revenue:** In a progressive system, a flat tax can lead to a loss of government revenue, as high-income earners pay a greater percentage of the total tax. This could reduce government benefits or increase other taxes.
- **Limited government flexibility:** Fixed taxes can limit a government's ability to use taxation to encourage certain behaviours and industries. This is because everyone pays the same tax rate regardless of the economic consequences of their actions.
- **Potential Regressive Impact on State and Local Taxes:** Some states and localities rely on a progressive income tax system to fund their businesses. Replacing these systems with flat taxes could shift the tax burden to lower income earners and exacerbate existing income inequalities.

Overall, the pros and cons of flat taxes depend on the specific circumstances in which they are implemented. They can simplify tax laws and promote jobs and investment, but they can also be regressive and limit government flexibility. It needs to be taken into account that the potential advantages and disadvantages will only manifest when the flat tax is implemented in specific forms, the associated advantages and disadvantages are not a given when implementing a flat tax, careful consideration is needed to realise the advantages while mitigating the disadvantages.

Progressive taxation:

A progressive tax is a tax that increases as the taxpayer's income increases. This means that people with higher incomes pay a higher percentage of their income in taxes than those with lower incomes. The advantages and disadvantages of progressive taxation are:

Advantages:

- **Justice:** Progressive taxation is often seen as fairer because it makes people who can afford to pay more tax. This reduces income inequality and spreads the tax burden more evenly.
- **Revenue generation:** A progressive tax can bring more revenue to a state than a flat or regressive tax. This is because higher income people pay a higher percentage of their income in taxes.
- **Promoting economic growth:** By tightening taxes on the wealthy, progressive taxation can encourage the wealthy to put their money back into the economy, boosting economic growth and job creation.

Disadvantages:

- **Discourage Hard Work:** Critics argue that progressive taxation discourages hard work and entrepreneurship. Individuals may feel that the more they earn, the more they will be taxed, which may discourage them from working harder or pursuing more profitable endeavours.
- **Reduced savings:** People who are taxed higher may have less disposable income to save and invest, and this can have long-term effects on their financial stability.
- **(More) Complicated:** Managing progressive taxation can be complex and costly, and can lead to inefficiencies and errors in tax collection and enforcement.
- **Tax avoidance:** Some argue that progressive taxation can lead to tax avoidance by those with the means, which can reduce overall tax revenues and undermine the effectiveness of the tax system.

Overall, progressive taxation has both strengths and weaknesses, and their effectiveness depends on how they are designed and implemented. While they help reduce income inequality and generate government revenue, they can also have unintended consequences that can stunt economic growth and create administrative challenges.

While the advantages of a flat tax system and a progressive system are generally known, most of these advantages of both systems are only realised in practice when implemented in its purest form. So, the legal loopholes that allow the richest to avoid their respective taxes make that redistribution with a progressive system is not realised to the effect that is suggested. It also makes that the total revenue is not a high, while in theory a progressive system should allow for higher tax returns for the government to fund its social programs.

The same is true for a flat tax system, only an absolute flat tax that covers all income types (box 1,2 and 3) would have the efficiency gains that proponents would suggest. The efficiency gains are also not realised as long as the loopholes and complex subsidies remain in the overall system. (De Mooij,

2008) found that most administrative complexities and costs come from the loopholes and subsidies, not the tax system its self. The tax compliance that should come with a flat tax also only works with an absolute flat tax so that there is no point attempting to allocate earnings in box 2 or 3 respectively instead of box 1.

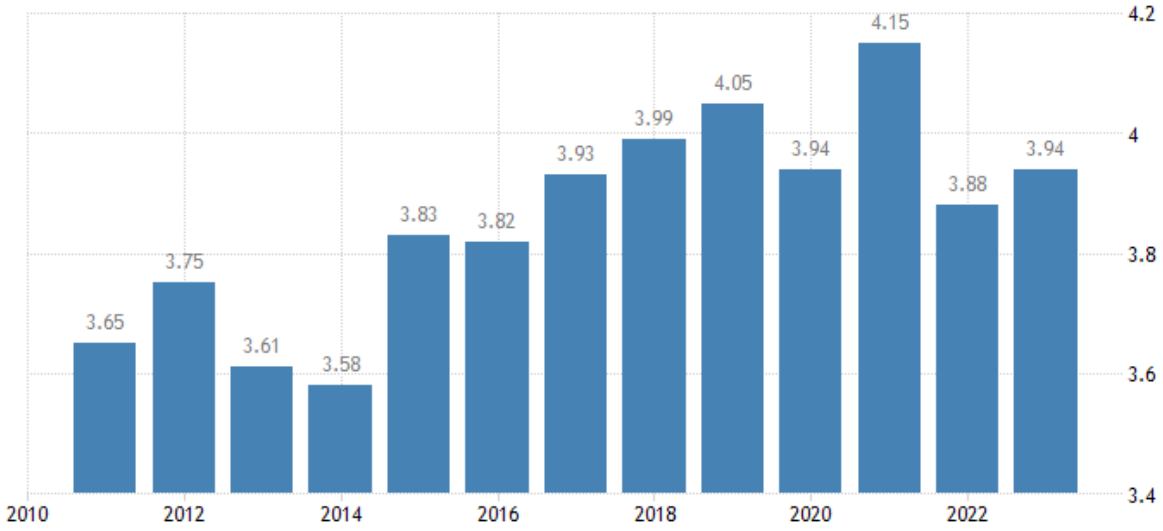

Figure 1 Income Inequality Index Netherlands (*Trading Economics Wealth Distribution*, n.d.)

As shown in figure 1 according to the Inequality Index the inequality in the Netherlands has only increased in the last 12 years, reaching a high of 4.15 in 2021. This means that under the progressive system income inequality has increased significantly. One would argue that it the income inequality would be even greater under a flat tax system. But the fact that one of the biggest selling points of a progressive system, that it should redistribute wealth to reduce income inequality doesn't seem to work is a significant finding.

Added to this is the fact that top one percent of earners in the Netherlands (and in the world) do not experience the effective tax rates that the progressive system would suggest. This is mostly because of multiple loopholes used by the top earners to reduce the effective tax rate on their earnings (Neck et al., 2012). So having a progressive system does not redistribute as much wealth as proponents of a progressive tax would suggest. While the top marginal tax rate in the Netherlands is 49.5% in 2022 for top earners, in practice the top one percent only paid an estimated 21% effective tax rate on their earnings according to estimations by NL-times[5]. Most other institutions estimating the effective tax rate have come up with similar percentages.

Long term benefits of economic growth on overall prosperity and thus social welfare.

2.4 Downsides Flat Tax System

Although some downsides have already been mentioned shortly in 2.2. This paragraph gives a more detailed explanation of the downsides of a flat tax system to give a more balanced view. (A. B. Atkinson & Stiglitz, 1976; Caminada & Goudswaard, 2001; De Mooij, 2008) found the following downsides when considering a flat tax system:

[5](*NL-TIMES*, 2022): "Middle-income and high-income households both contribute about 40 percent of their income to taxes. But the 1 percent highest earners only spend 21 percent of their income on taxes - less than the lowest earners, NRC reports based on a new study by central planning office CPB."

- **Lack of Progressiveness:** One of the main criticisms of flat tax systems is their lack of progressiveness. This means that high-income earners do not pay a higher percentage of their income in taxes than low-income earners. This can lead to a regressive tax burden, with those who can afford to pay more end up paying less in tax, and those who cannot afford to pay, end up paying a higher percentage of their income. Compared to a progressive system where this effect could be mitigated by increased redistribution from richer individuals to fewer wealthy individuals. However, the effect of the lack of progressiveness could exacerbate income inequality under a flat tax system, disproportionately hitting low-income earners.
- **Disproportionate impact on low-income people:** Under a flat tax system, low-income earners may be taxed proportionately higher compared to high-income earners. This is because tax rates are the same for everyone, and even a small percentage of your income can represent a significant portion of your overall budget. This makes it difficult for low-income individuals to meet their basic needs, which can lead to poverty and economic inequality. This effect is often called the poverty trap, where lower income individuals (or families) do not have enough left after taxes to make significant steps to increase their standard of living.
- **Decrease in government revenue:** Depending on the specific tax rate chosen in the flat tax system, government revenue may decrease. High-income earners may pay less in taxes compared to a progressive tax system, so less revenue may be available for governments to fund public services such as education, health care and welfare programs etc. This can create budgetary constraints and affect the government's ability to provide basic services to its citizens.
- **Limited ability to deal with social problems:** A flat tax system may limit the ability to address social issues through tax law. In a progressive tax system, governments can use progressive tax rates to implement policies such as tax credits and deductions to incentivize behaviour such as charitable donations, spending on education, and investing in renewable energy. In a flat tax system, such targeted tax measures may be ineffective or impossible, potentially limiting governments' ability to address social problems and encourage desirable behaviour.
- **Unfair distribution of tax burden or poverty trap:** In a flat tax system, people with different tax capacities bear the same tax burden. For example, a person with a chronic disease or disability that causes large medical bills may find it difficult to pay the same tax rate as a healthy person with minimal medical bills. This can lead to an unfair distribution of the tax burden and a lack of consideration for individual circumstances.
- **Limited flexibility in responding to economic changes:** A flat tax system may lack the flexibility to respond to changing economic conditions. For example, during economic downturns, failure to adjust the flat tax rate to reflect changes in income levels could reduce government revenues, prompting the government to implement stimulus measures or reduce economic inequalities. It will be difficult to deal with it effectively.

In summary, a flat tax system can simplify tax law and boost economic growth, but it lacks progress, disproportionately impacts low-income earners, reduces government revenues, and limits the ability to address social problems. There are also some drawbacks, such as unfair distribution, tax burden, potential for tax evasion and avoidance, and limited flexibility in responding to economic change. These variables need to be considered. Another factor that needs to be considered is that the maximized advantages are only realised with an absolute flat tax, no complicated subsidies and no loopholes to avoid taxes. Meaning that realistically an absolute flat tax could not be successfully implemented without serious consequences.

2.5 Negative Tax System

Negative taxation, is a government policy that provides financial assistance to individuals or households whose income falls below a certain threshold. The purpose of negative taxation is to alleviate poverty and reduce income inequality by ensuring that everyone has access to a minimum standard of living (Bawden, 1969).

The concept of negative taxation was first proposed by economist Milton Friedman in the 1960s as an alternative to traditional welfare programs. Rather than targeting specific groups, negative taxation provides assistance when an individual's earnings are below a certain threshold. This is different from a universal basic income (UBI) as an UBI would be given to anyone regardless of income level which results in a higher taxation as this is an expensive system. Negative taxation however will only apply if an individual's earnings are below the set threshold, after an individual earns more than the threshold they start to pay the normal tax rate.

The basic idea behind negative taxation is that the government sets an income threshold, below which individuals (or households) receive financial assistance. For example, if the threshold is set at 20.000 a year, and an individual earns only 15.000, the government will pay 5.000 to raise their income to the threshold. This payment comes in the form of a tax credit that is deducted from the individual's tax liability, or in cash if the tax liability is zero or negative. This form of negative taxes is costly and has a close resemblance to a universal basic income. Another less costly form of negative taxation is the percentage system that works up to the threshold. So, if an individual earns 15.000 a negative tax rate of 25% could apply that would bring the final amount to 18.750. This rate would reduce when income comes closer to the threshold, this is to ensure that more work will always result in more net income.

One of the benefits of negative taxation is that it eliminates the welfare trap where individuals stop working because too much income erodes profits. Under negative taxation, individuals are always entitled to some financial assistance even if they earn above the threshold. This provides an incentive to work and earn more as individuals are always financially well off. Another advantage of negative taxation is that it is simpler and less bureaucratic than traditional welfare programs. There is no need to apply for multiple benefits or programs and individuals receive a single payment based on their income level.

However, a potential drawback of negative taxation is that it can be costly for governments to enforce. It may also be viewed as unfair by some taxpayers, who are obliged to subsidize the income of others, especially if they are in dire straits. This is however considered a 'necessary evil' to prevent the poverty trap and allow everyone in a given country to enjoy a certain standard of living. It should also be noted that a majority of the Netherlands support at least some level of social subsidies for the poor, the Netherlands pay some of the highest percentage of their income on social security (*Cbs.Nl/Poverty-Scale*, n.d.). Thus, the discussion is more about how high the social subsidies should be and not about should those subsidies exist or not. It should be noted that while a negative tax system is a costly program (depending on the hight of the tax) it is cheaper than most other alternatives. A universal basic income is not selective in when or where it applies, a CEO gets it and someone with almost nothing gets it. Compared to a negative tax, which only applies when an individual's income is below the set threshold. This is why for this research a negative tax will be used in the simulations, to prevent the poverty trap.

In summary, negative taxation is a government policy that provides financial support to individuals or households whose income falls below a certain threshold. It has the potential to alleviate poverty and reduce income inequality, but it is costly to implement and may be viewed as unfair by some taxpayers.

2.6 Dutch Tax System & Social Benefits

The Dutch tax system is characterized by progressive taxation and comprehensive social benefits, including health and education. Under this system, individuals and businesses must pay taxes based on their income, property and consumption. This paragraph details the various taxes and benefits in the Dutch tax system (*Home @ Www.Belastingdienst.Nl*, n.d.). Behind each tax type the percentage is given that the specific tax contributes to the overall tax revenue of the government. (Some very specific taxes like inheritance tax have been excluded as those taxes do not have a significant contribution to the overall tax revenue, thus it has no added value to include them in this list.) See Appendix 3 for alle tax types in the Netherlands and courses.

Income tax (34.21%):

The Dutch income tax system is progressive. In other words, as your income increases, your tax rate increases. The personal tax rate for 2022 ranges from 9.7% to 49.5%. Income tax is levied on the following three types of income:

Income from work and home ownership (BOX 1), income from investments in a limited company (BOX 2), income from assets and savings (BOX 3). Additionally, various tax credits and tax credits are available to help reduce your personal tax burden, including: General Tax Credit, Labour Tax Credit, Mortgage Interest Credit.

The Dutch wealth tax or wealth tax is a tax on personal property (BOX 3). The tax rate for 2022 is 0.59% for net worth up to €50,000 and 1.76% for net worth over €50,000. However, there are some allowances and deductions such as: Allowance of EUR 50,000 per person and deduction for certain assets.

Corporate tax (10.58%):

Companies doing business in the Netherlands must pay corporate tax on their profits. The corporate tax rate for 2022 is 15% on profits up to €245,000 and 25% on profits above that. Businesses may also be eligible for multiple tax credits and exemptions, including: Participation Exemption for Dividends Received from Foreign Subsidiaries.

Contribution to Social Security (Totals 112.5 billion euros in 2020, which is about a third of the total revenue):

Both employers and employees in the Netherlands must pay social security contributions that fund the country's comprehensive welfare system. Contributions include health, pension, disability and unemployment benefits. The total rate of social security contributions in 2022 is 42% of an employee's gross salary, with employers and employees paying half each.

Value Added Tax (VAT) (28.75%):

Dutch VAT or BTW is a sales tax levied on most goods and services sold within the country. The normal VAT rate is currently 21%, but there are reduced rates of 9% and 0% for certain goods and services such as: For example, groceries and books.

Social benefit:

The Dutch tax system offers a wide range of social benefits for individuals and families, including health care, education and housing benefits. These benefits are funded from taxes and social security contributions and are means-tested. In other words, the benefit amount depends on the income and assets of the individual. In summary, the Dutch tax system is a comprehensive and progressive system

that offers citizens a range of social benefits. The system aims to ensure that everyone contributes to society and that those in need receive the support they need.

For this paper there is no added value to list all social benefits that the Netherlands provide, this is because the paper focusses mostly on the tax system and a negative tax system to mitigate the disadvantages of a flat tax. Because there are too many different social benefits and/or subsidies to list them all in this paper, here is the link to the government site (*Www.Government.Nl/Social-Assistance*, n.d.) a list has been made of the different social benefits and when an individual is eligible to receive a given social benefit.

This paper aims to include income tax & corporate tax, if the model works for these taxes (which are some of the biggest contributors to the tax revenue it can expand to include the other taxes. The decision to at first only include these taxes is due to this model not having any existing proven results in literature or practice. It is therefore decided that the focus of the model should be that it works first and foremost on the majority of tax contributors. After that the model could potentially expand to the other tax types and other outliers.

2.7 Gap in Literature & Contribution of Thesis

Existing papers about flat tax reform in the Netherlands are about 20 years old and include the old tax system, with the Dutch tax system being reformed multiple times in the last 20 years means that the literature is in need of new up to date research.

No existing literature has been found that attempts to combine a flat tax with a negative tax. This paper aims to provide new insights and possibly provide the Dutch government with a new tool to use in the pursued of maximizing social welfare.

There is limited existing literature about implementing and simulating a negative tax system, this paper aims to add to the literature and show that a negative taxation has the potential to be a viable tool to include into the overall tax system.

A negative flat tax has the potential to mitigate some of the disadvantages of a flat tax system. This means that the combination of the two could potentially significantly reduce the effect of the disadvantages associated with a flat tax. The paper aims to provide the readers with new insight into what a flat tax could look like, which is an addition to the existing literature.

3 Research Methodology

3.1 Introduction

In this chapter of the thesis the methodology used will be explained, the research design, the rationale behind the decisions made and the objective of the of the research. This chapter will also go into the data used and the rationale for using this specific data, the way the needed data was collected and the shortcomings of the data used and the research design overall.

To answer the research question: *"Which variation of the 'flat tax' system could be a realistic alternative to replace the current Dutch 'Progressive tax' system?"* a simulation tool is made to simulate the expected taxes that need to be paid for different income levels under different tax regimes. The simulation tool will compare a range of income levels under different (flat) tax regimes to see who pays which amount under which system and also compare overall tax revenues for the Dutch government. The results of the flat tax simulations are then compared to a simulation of the progressive tax system that is currently in place in the Netherlands. For the progressive system simulation, the same income range and overall total income is used to make the results a comparable as possible with the flat tax simulation results.

3.2 Research Design

The simulation tool that is designed for this thesis consists of two parts, the negative tax rate and the flat tax rate. With also a transition period in between the two where the tax rate increases from the effective negative rate up to the flat rate. Within the simulation tool it is possible to widen or shrink the negative tax base and normal tax base, but also increase of decrease the respective negative tax rate and normal flat tax rate. This allows for multiple different variants of the negative tax and flat tax combination, which can later be compared with the current progressive system. It also allows for the ability to decide how big and generous the social security should be within the tax system, instead of having social security and taxation being two completely separated systems.

The first part focusses on the 'negative tax base' which is a form of social security and is designed to provide the individuals with a lower income level with a negative tax credit to increase their net income. Which means that when a flat tax of 30% applies and for an income of 10.000 euro's a negative tax rate of 50% applies, the individuals will have to pay (30% - 50% =) -20%. This means that the individuals are to receive 20% on top of his or her 10.000 euro income, totalling 12.000 euro's net income (or 120% of gross income). When an individual makes for instance 16.000 euro's a negative tax rate of 25% applies, the same 30% flat tax applies. Meaning the effective tax rate for this individual is (30% - 25% =) 5%, meaning that individual has to pay (5% * 16.000 =) 800 euro's in taxes. This brings his or her net income to 15.200 euro's. Finally, if an individual's income is 40.000 euro's, the negative tax rate is 0% the flat tax rate is still 30%. The net income of this individual is 40.000 - (30% * 40.000) = 28.000 euro's.[6]

As mentioned earlier in the paper, an advantages of a flat tax system are that it is supposed to reward people to work more and/or harder. To ensure this is still the case when combining a negative tax with a flat tax the following decisions have been made with regard to the simulation tool and its interpretation of the negative tax system:

[6] The tax rates and negative tax base in this paragraph are just for example and do not necessarily represent the results of the research.

By making the tax increases relatively small from the lowest income level with the highest negative tax up to income level when the full flat tax applies, this paper assumes that the psychological negative experience of paying more taxes when earning more is mitigated. This is assumed because:

- Firstly, the net income always increases significantly more compared to the slight increase in relative tax burden. For example, the effective tax would increase only 1% for every 250 euro's an individual earns more on a yearly bases, up to the income level where the flat tax rate full applies;
- Secondly, because the increases are so small the relative differences between the rate before the increase and after the increase is not big enough for people to feel punished in the same why the current progressive system does.
- Finally, negative taxes (as a system) also provide the government with a new tool, how wide and/or deep do you make the negative taxes (the negative tax rate and base). Thus, controlling the social safety net and tax system in one model, which allows the government to balance the two. Which makes it a tool that can be tailored to both left and right leaning ideology, this gives it more political validity as a non-biased tool.

The second part of the simulation is the income range on which the full flat tax applies, meaning from the first income level where the full flat tax needs to be paid and any income above that. This part of the tax system is responsible for the governments tax revenue, meaning the height of the tax rate and the size of the tax base determine the tax revenue here. If the tax base is too small, tax rates need to compensate for that. If the tax base is too large, it could mean that lower income levels have to pay a proportionally part of their income in taxes. Which could result in a poverty trap.

The poverty trap shows the importance of the negative tax system, it not only puts taxation and social security in the same system but also makes a flat tax system more 'progressive' in a way. Or perhaps a better description is: able to counter the poverty trap which makes a flat tax system an overall more appealing option to consider. This means that the combination of the negative taxes and flat tax is more progressive with the negative taxes in place, but also maintains its advantages as a system that promotes work and productivity.

A visual representation of an example model is given in figure 2. This figure shows a tax base that starts at 5.000 euros and shows how the negative taxes of 50% would apply in a decreasing level up to 12.500 euros, at this point the negative tax rate equals the flat tax rate. This would result in an effective tax rate of 0% at 12.500 euros. From 12.500 euros up to 17.500 euros the negative tax would provide a decreasing level of tax relieve, up to the income level where the flat tax rate of 20% would apply in full. Which would be 17.500 euros and up. The blue lines represent the effective tax rate that applies on a specific gross income, the orange line represents the net income after the effective tax is applied.

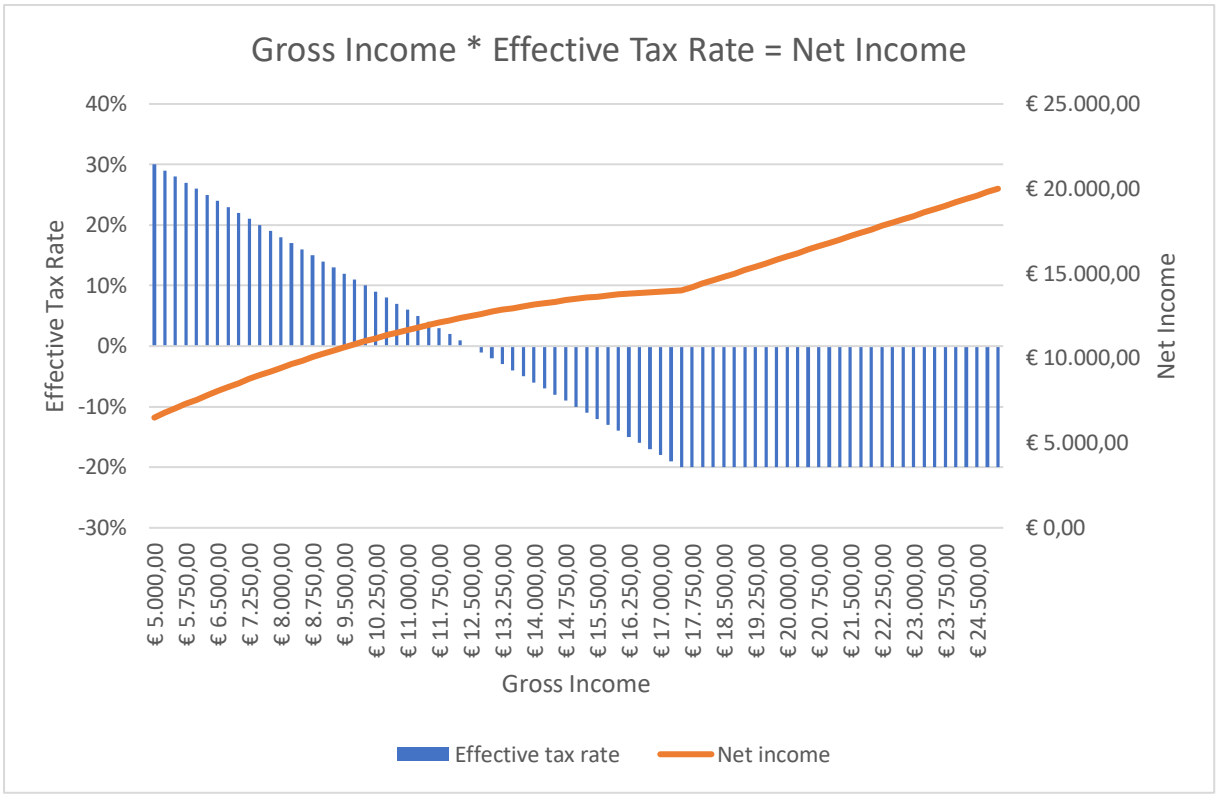

Figure 2 Example Model Negative Tax & Flat Tax (source: Calculation Model Negative & Flat Tax)

Figure 3 shows how the tax contribution would approximately be divided along the different income levels. It shows (like explained in figure 2) that the lower income levels actually receive a contribution on top of their gross income. The higher the gross income gets, the less contribution is given up to the point where taxes are starting to get paid. The taxes increase up to the determined flat tax rate at a determined income level, after which the taxes stays at the flat rate for every income above that point.

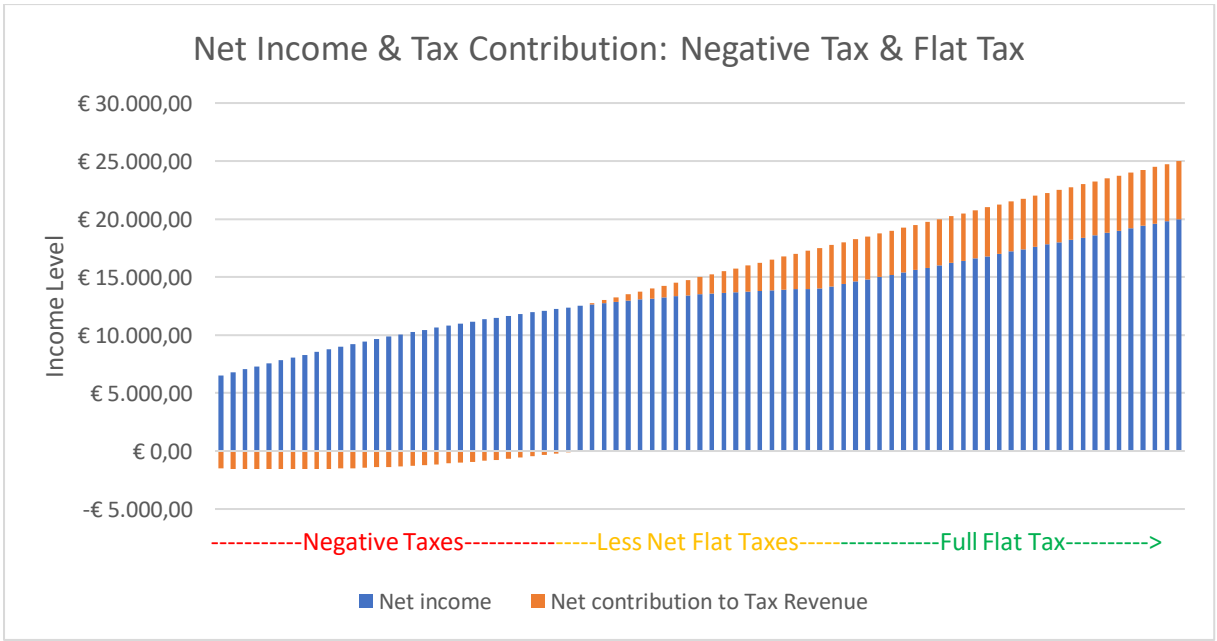

Figure 3 Example Model Negative Tax & Flat Tax, Tax Contributions (source: Calculation Model Negative & Flat Tax)

It should be noted that in practice wages and thus gross income can fluctuate over a year, this means that there needs to be an after calculation to determine what taxes are owed exactly. This is similar to the current tax system where an after calculation is also used to settle any discrepancies, it should therefore not be a significant problem when implementing the new system.

Another note is that the calculation model for similations is an oversimplified system that includes only a small number of taxes and subsidies. Most of the taxes that currently exist in the Netherlands are not included. Only (some) the largest contributor(s) to the governments tax revenue are included. This has been done to make the research more achievable within the given time frame and resources. The decision to only include the largest contributor to the governments tax revenue (the income tax or tax on labour) in the calculation makes sense. This is because the combination of the two taxes (negative taxes & flat taxes) under a new system is a not a proven viable alternative as of now, therefore this paper aims to ensure that the new system works for the (in pareto terms) 20% that is responsible for 80% of the revenue. If this paper proves (or partially proves) that in theory the new system could be a viable replacement for the existing system, then the remaining taxes (& subsidies) could be included. This would most likely result in necessary adjustments needing to be made to make the system work with all extra inclusions and balance the tax rates and tax bases accordingly.

In the model there are also no specific subsidies included to be replaced by the negative tax, this would be a research topic in of itself. This paper aims to provide a starting point that proves in that theory a negative tax could work to support and/or alleviate the lower income individuals (preventing the poverty trap), thus providing a potential replacement for (some) subsidies if implemented. This is in reality a very complex endeavour and requires much more detailed analysis and consideration. More likely than not, it would become clear that it is not possible to replace every subsidy that currently exists in the Netherlands with a negative tax. This is because not all subsidies are income related and thus could not be intergraded into a negative tax system, which only looks at income level to determine when and how much an individual should receive or pay something. Subsidies like rent subsidies could be included as they are already income related, but childcare subsidies are not only income related and thus can likely not be effectively included.

3.3 Data Collection

Population Data

The data used as input for the simulation tool is 2020 income distribution data from the Netherlands from the Central Bureau of Statistics (CBS). This is the most recent data that has been verified by the Dutch government at the point of writing this thesis, because there do not seem to be significant increases in provisional 2021 data it is not expected that using other data will give significantly differing results. The data consists of the income level of a groups from -6 thousand euros annually up to more than 100 thousand euros annually and the number of individuals in a specific income group. This data forms the bases of all the results that come out of the simulation tool, it is used to determine how to structure the negative taxes (how wide and how high) and also to determine from which point the flat tax should be in full effect. For the simulations outliers from the data have been removed, for the negative lower income groups this has been done because the calculations would not work on a negative income. The highest incomes have been excluded because that groups range is too big, 100 thousand euros and up. No average could be accurately determined based on this data, thus it is excluded from the calculations. While tax revenues will likely be lower because of the exclusion of the highest incomes, it should not have a significant effect on the workings of the model. Most likely tax revenues will be underestimated, but at this stage of the development of the new tax model this is not a problem. In later stages more accurate up to date, data will be used as input for the model so this problem will solve itself in later stages which better more accurate data.

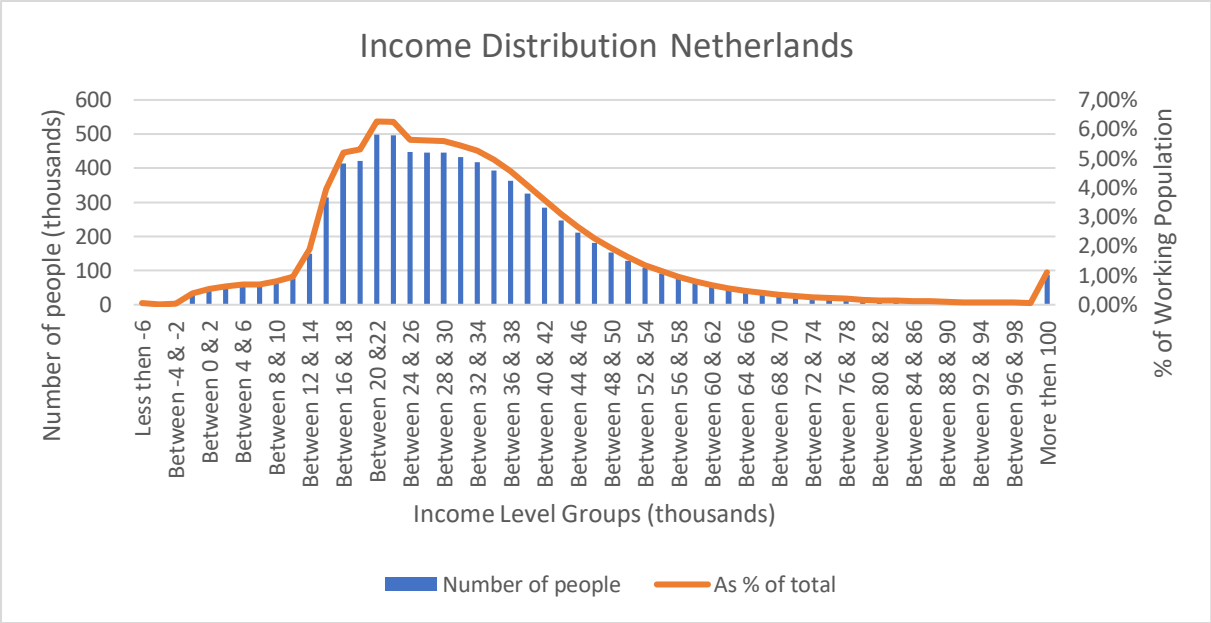

Figure 4 Income Distribution Netherlands (source: Calculation Model Negative & Flat Tax)

Figure 4 shows the income distribution curve in the Netherlands, this data shows how much and how many people earn a specific income in the Netherlands in 2020. This helps to identify which people require financial assistance (identifying the negative tax base) and where the most income can be taxed (identifying the tax base). This income distribution shows that the first income groups on the left have a negative income, these outliers are excluded because the model does not work on a negative income. On the right side a spike in the amount of people can be seen, these outliers are also excluded because is not possible to calculate an accurate average income of this group as the income range (100.000 euros and up) is too large.

3.4 Data Current Progressive System

The data about the progressive tax system is gathered from the official website from the Dutch Tax Agency (Belastingdienst). For this paper the progressive system from 2020 has been used because this corresponds with the other data used from 2020 and has been verified by the tax agency at the point of writing. This system is slightly different from the system in place in 2023, with the tax rates marginally different. But overall, the system is mostly the similar and outcomes in the simulations will only differ marginally. The lowest tax bracket of 36.65% is removed in 2023 meaning there are only 2 brackets left, but because this lower bracket is only slightly lower than the second bracket of 38.1% the overall effect on revenues will be small. The final tax bracket in 2020 is 51.75%, which is significantly higher than the other tax brackets. The overall structure of the 2020 and 2023 tax model is mostly the same and should not give significantly different outcomes.

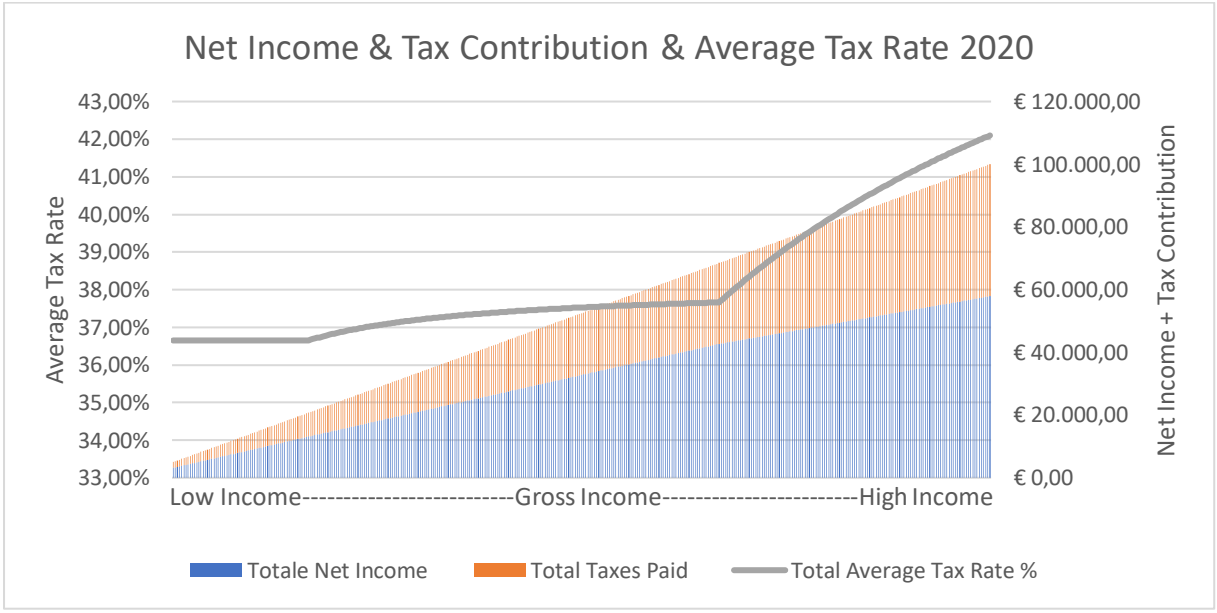

Figure 5 Example Income Level Tax Contribution Progressive System (source: Calculation Model Negative & Flat Tax)

Figure 5 shows how the 2020 progressive tax system would apply on an income range of 8.750 euros (from this point on income can be taxed) up to 100.000 euros. In 2020 there were three tax brackets within box 1 which can be seen by the line representing the average tax rate on specific income levels.

4 Results

4.1 Introduction

In the simulations multiple variants of the negative tax and flat tax combination have been made. For the readability of the paper only one 'mean' variant is included in the results chapter. The other variants with higher and lower tax rates, wider and slimmer negative tax bases are in the calculations document delivered with this paper. The results are displayed in graphs to compare the results of the flat tax with the progressive tax that has also been simulated under the same conditions, this is to make the results as comparable as possible. It should be noted that the results of the simulations of the progressive system differ from the real-world tax revenue data given by the Dutch government. This is likely due to several tax breaks that apply on wages included in the data but are not specifically distinguished. This discrepancy in results have been taken into account and significant tax breaks that had not been included in the model have later been added. Such as the tax break (belastingvrije voet) from 0 to 8.750 euros that applied in 2020.

4.2 Different Perspectives Applied in the Model

The negative tax and flat tax model has multiple different versions in which it could be implemented as the Dutch tax system. It provides the government the ability to 'play' if you will with the different variables to make it suitable to the political climate that is dominant at that time. The government could increase or decrease the negative tax rate, which determines how generous the social safety net will be. The size of the income range on which the negative tax applies, this determines how many income levels receive a negative tax credit. The new system also allows the government to determine the rate at which the negative taxes decreases as income increases, this allows for a more precise tool to support the lower income levels (net income should always increase as gross income increases, this should be taken into account when altering the model).

The variables mentioned above have been used to make three different versions of the negative tax and flat tax model, a version which is more right leaning, left leaning and a balanced version which results are most comparable to the current progressive system. This has been done to show that the model is useful in a range of different political climates and could be adjusted to suit different political ideologies.

In one of the models made from a left leaning perspective has a 80% negative tax, this means that the lowest income levels have almost double their gross income. With the 80% negative tax two variants have been made, one which has a linear reduction in the negative tax rate and one which has a non-linear reduction of the negative tax rate. The linear negative tax reduction results in a larger overall range of income levels that receive a negative tax credit compared to the non-linear version.

One of the models that is more right leaning has a negative tax of 50% and a flat rate of 27.5%, which is much less generous compared to the left leaning version. This will allow for a lower overall flat tax rate which means that at the income level where the full flat tax applies, net income is higher compared to the more generous left leaning version.

For more details on the right and left leaning versions of the model, look at the calculations document delivered with this paper. The balanced version of the model is described in detail in the next paragraph as the results from this version are most comparable with the results form the progressive system simulations.

4.3 Results from Negative Tax & Flat Tax Simulations

Figure 6 shows how a negative tax of 60% (32.5% - 60% =) or an effective tax rate of -28.5% applies on the lowest taxable income 5.000 euro. Which means that the net income is 128.5% = 6.425 euro, the negative tax increases the income of individuals up to 11.750 euros. After this point people start to pay an increasing tax rate up to the point where the negative tax rate is 0% and the flat tax rate set at 32.5% effectively applies. At an income of 21.750 euros individuals start to pay the full flat tax. As can be seen in figure 6, this gives a level of support and/or tax relieve to the lowest income levels. While still being able to tax the majority of incomes to full effect.

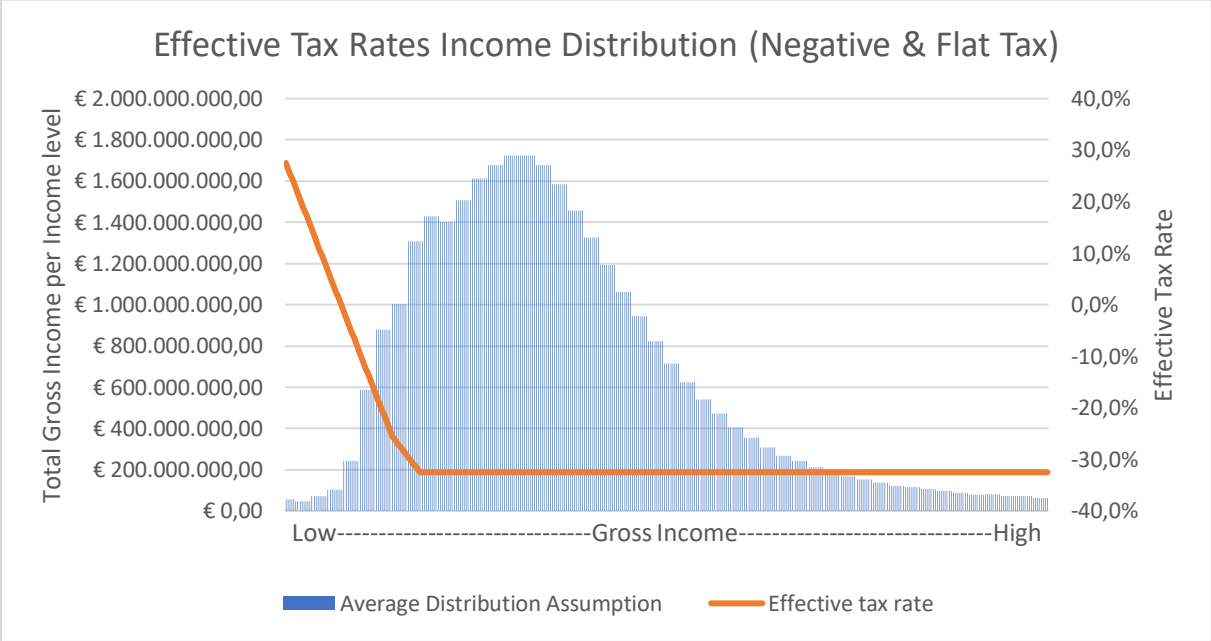

Figure 6 Negative Tax & Flat Tax Applied on Income Distribution Netherlands (source: Calculation Model Negative & Flat Tax)

Figure 6 helps to visualize how the population income is distributed, this gives policy makers the ability to balance the negative taxes to support the less wealthy, while balancing this with the flat tax on the rest of the population to pay for everything.

To summarize, this variation of negative tax and flat tax applies as followed:

Negative Tax of 60% & Flat Tax of 32.5%	**Income Range**
Negative taxes increase net income of lower income level individuals, the effect decreases as income increases. The maximum effective negative tax = (32.5% - 60% =) 28.5% = 128.5% of gross income at 5.000 euros.	From 5.000 euros up to 11.750 euros. In this variation of the flat tax system no taxes are paid over the first 5.000 euros, but also no negative taxes apply.
Negative taxes provide a tax relieve by covering individuals partially from the full flat tax, resulting in a lower effective tax rate. The effect of the negative taxes decreases as income increases.	From 11.750 euros up to 21.750 euros.
Negative taxes are 0% which results in the effective tax rate and flat tax rate being equal at 32.5%. From this income level and higher the full flat tax applies.	From 21.750 euros and up.

Table 1 Explanation Negative Tax & Flat Tax Model

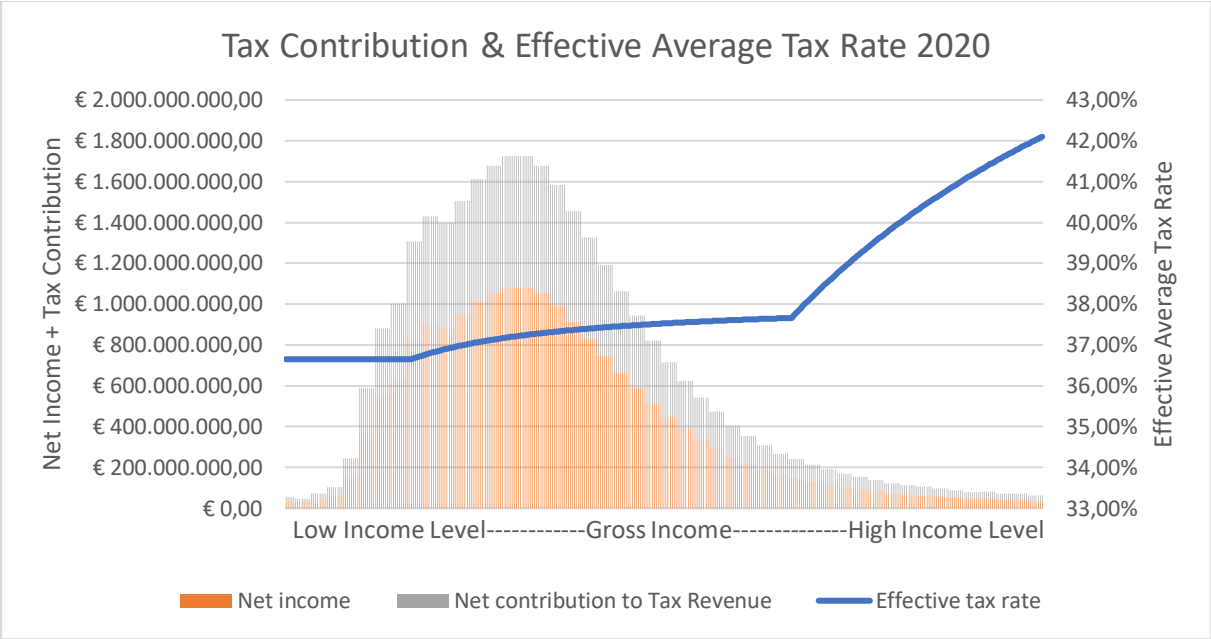

Figure 7 Tax Contribution & Effective Tax Rate (source: Calculation Model Negative & Flat Tax)

In figure 7 the effect of the 2020 progressive tax system is simulated. The three different tax brackets are clearly visible in the figure and shows that the middle bracket applies to the largest income group in the Netherlands. It should be noted that in the Netherlands in 2020 individuals do not have to pay taxes on the first 8.750 euros they earn. This is not included in the model and is subtracted after the calculations.

Annual Taxable Income Range (Gross)	**Tax Rates**
0 euros - 20.384 euros (0 - 8.750 euros tax free)	36.65%
20.385 euros - 68.507 euros	38.10%
68.508 euros - UP	51.75%

Table 2 Tax Brackets Dutch Taxes 2020 (source: CBS Historic Dutch Tax Data 2020)

In Figure 8 it is shown where the negative taxes support the lower incomes, the net contribution to the tax revenue is negative on the lower income levels. This is because the government actually increases those lower incomes with the effective negative tax rates, as this effect decreases a period is reached where non or almost no taxes are paid. Then the taxes increase to the point where the full flat tax applies, this coincides with the income levels that represent the largest representation of total taxable income in the Netherlands. This is important because this is where the majority of the tax revenue is made, the large contribution in seen around the peak of the distribution curve.

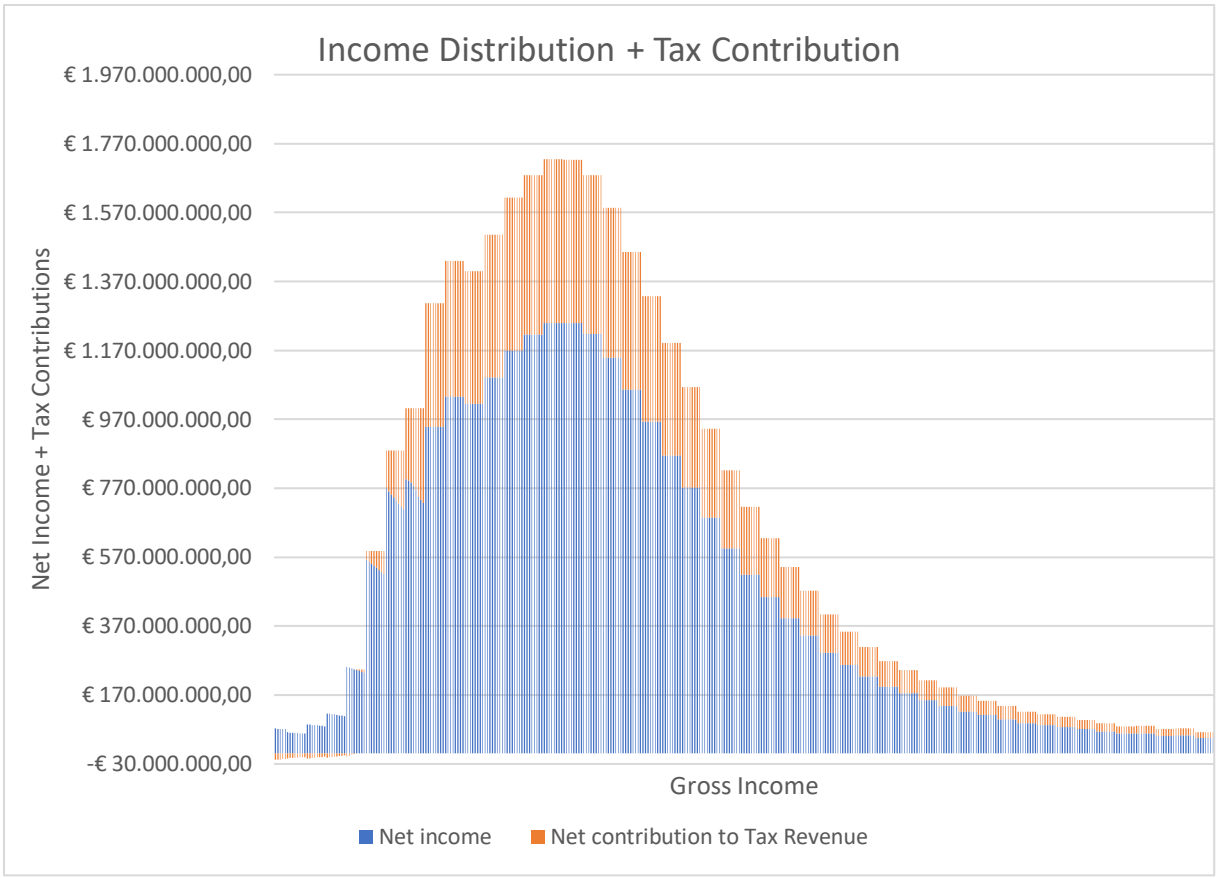

Figure 8 Income Distribution, Net Income + Tax Contribution (source: Calculation Model Negative & Flat Tax)

Comparing figure 8 which shows the tax contributions under the negative and flat tax combination to figure 7 with the tax contributions under the 2020 progressive system, shows that the relative tax burden on the different income levels does not seem to shift significantly. This is important because the relative tax burden should not shift significantly to a specific income level or levels, otherwise it would not be a realistic alternative to the progressive system.

Figure 8 could give the wrong impression that the middle class or median income classes are paying more taxes than the richer income classes after them. This is because there are more people in the median income classes, meaning as an income class they make more money than the richer income classes. It is (gross income * the number of people making close to that income) which is why more revenue is generated from those median income classes, they represent the most income as a class.

To clarify it, in figure 9 is shown how the negative tax and flat tax apply on any specific income in the range from 5.000 to 100.000 gross annually. This clearly shows that the negative tax decreases as income increases. The tax burden increases as income increases, and the flat tax applies in full from 21.750 euros and higher. From that point on every individual pays the same proportion of their income in taxes, this should in theory stimulate people to work harder and earn more in the process.

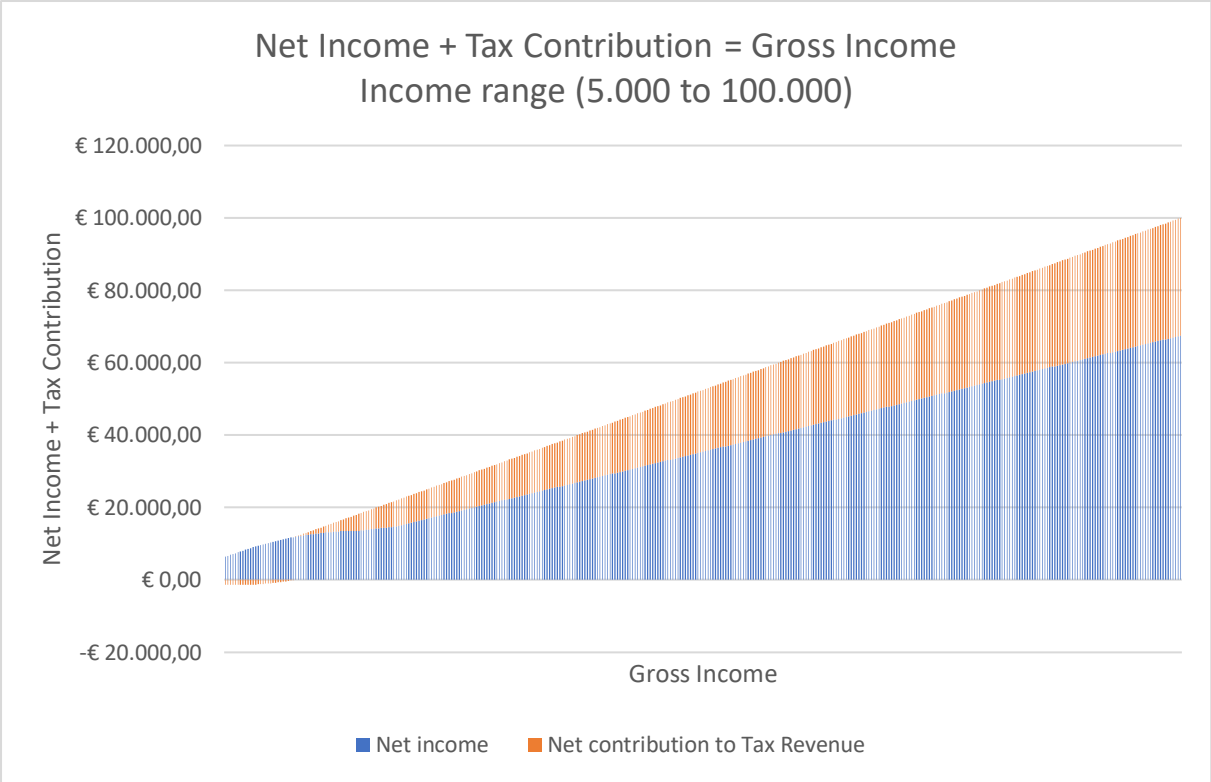

Figure 9 Net Income + Tax Contribution for Income Range 5.000 to 100.000 (source: Calculation Model Negative & Flat Tax)

In figure 10 shows the income distribution for the Netherlands in 2020 given, the figure shows the cumulative net income of a specific income level (from low to high). Stacked on top of the net income is the total cumulative tax contribution of the specific income levels. The line represents the average effective tax contribution from the specific income levels, it increases as the total income of the income levels increase.

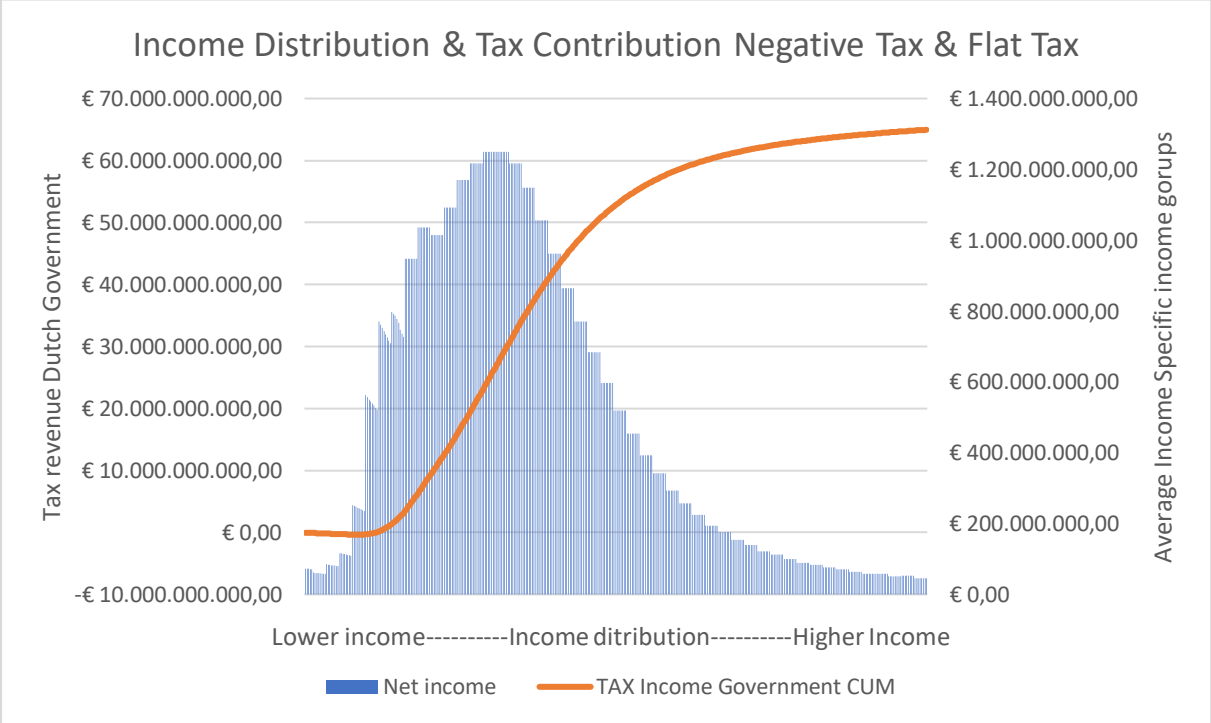

Figure 10 Income Distribution & Total Cumulative Tax Contribution Flat Tax (source: Calculation Model Negative & Flat Tax)

What the cumulative tax revenue in figure 10 also shows how the majority of the tax revenue is generated by the income groups earning between 20.000 euros and 46.000 euro annually. These income classes represent 63.02% of the total tax revenue while only representing 27.03% of the income groups.

4.4 Key Figures from Simulations

In this paragraph a quantitative comparison has been made to give insight into the differences between the two systems. Both tax systems were given the same data input thus making the conditions as comparable as possible, which makes the results that came out of the oversimplified simulation as comparable as possible.

It should again be noted that the simulation done for this research is a significant oversimplification of the reality. However, the results of the simulations do help to understand the reality better, even if a number of other factors would affect the results in reality. These key figures do not say if one system is better compared to the other, the figures represent two different approaches to generate tax revenue to ultimately improve the Netherlands and as a result improve the lives of the people living in the Netherlands. For the simulation 2020 income data and distribution data were inserted into the model to estimate what the expected tax revenue and distribution of the tax burden would be under the different tax systems.

The progressive simulation has three different tax rates that apply on three different income levels, it is known from figure 7 that the majority of the tax revenue is collected by the first two tax brackets (36.65% and 38.10%), and this shows in the overall average effective tax rate of 37,34%. The final tax bracket of 51,75% only applies on the higher end of the income levels and as can be seen in figure 7 does not allow for as much income to be taxed compared to the other tax brackets.

Results from Progressive Tax Simulation	Key Figures
Total Gross Income =	€ 248.906.000.000,00
Total Net Income Individuals =	€ 155.969.498.851,85
Total Tax Revenue Government =	€ 92.936.501.148,15
Tax Rate Set =	36,65%, 38,1%, 51,75%
Effective Average Tax Rate =	37,34%

Table 3 Key Figures Simulation Progressive Tax (source: Calculation Model Negative & Flat Tax)

The simulation of the progressive system on 2020 income data gives a tax revenue of almost 93 billion euros. However, under the progressive system individuals do not have to pay taxes over the first 8.750 euros under the 2020 progressive system. This would mean that the lowest tax bracket of ((36.65% * 8.750 =) * the number of working individuals) should be excluded from the calculated 93 billion euros tax revenue. In the data used are 7.95 million working individuals included, a small number make less than the 8.750 tax free limit. Including these into the calculation should not significantly skew the results. (7.95 million * (36.65% * 8.750)) gives approximately 25.5 billion euros of taxes that is not collected, this would bring the net tax revenue to 67,442 billion euros. The CBS data gives a tax revenue from income of 70,2 billion euros in 2020 (see appendix 3 2020 CBS data). When taking into account that the top earner outliers have been excluded from the simulations, which would have increased the tax revenue in the simulation. It is assumed that the result (67,442 billion euros) is close enough to the real reported revenue by the CBS to say that the simulation is mostly accurate (within margin of error).

The simulation of the negative tax and flat tax system, also using 2020 income data gives a tax revenue of 76,939 billion euros. The higher net revenue is reached by taxing al income including the first 8.750

euros of an individual's income. This also allows for a lower overall flat tax rate (32.5%) because the full income is taxed, only people who earn less than 5.000 a year are not taxed, the implications of this are discussed in the evaluation chapter 5. The negative tax system has paid out 231 million euros directly, on top of this the have negative taxes decreased the effective tax rate before the full flat tax applied. When calculation the difference between the flat tax rate set and the overall average effective tax rate, gives an overall cost of the negative tax system of 4.6% of the total tax revenue. This shows that the most expensive part of the negative tax is the tax reduction that is does on the higher end of the lower income levels.

Results from Negative Tax & Flat Tax Simulation	Key Figures
Total Gross Income =	€ 248.906.000.000,00
Total Net Income Individuals =	€ 171.735.026.250,00
Total Tax Revenue Government =	€ 77.170.973.750,00
Total Negative taxes paid =	-€ 231.247.500,00
Total Net Revenue =	€ 76.939.726.250,00
Tax Rate Set =	32,5%
Effective Tax Rate after Negative Taxes =	31,00%
Total Cost of Negative taxes as % of Total Revenue =	4,60%

Table 4 Key Figures Negative Tax & Flat Tax Simulation (source: Calculation Model Negative & Flat Tax)

The overall revenues and tax rates are relatively comparable, with the biggest difference between the two systems being in the structure of the tax base and the taxable income. By not taxing the first 8.750 euros of an individual's income under the progressive system, makes that the tax burden has to shift to the income above 8.750 euros. This results in higher overall tax rates to compensate for the slimmer tax base.

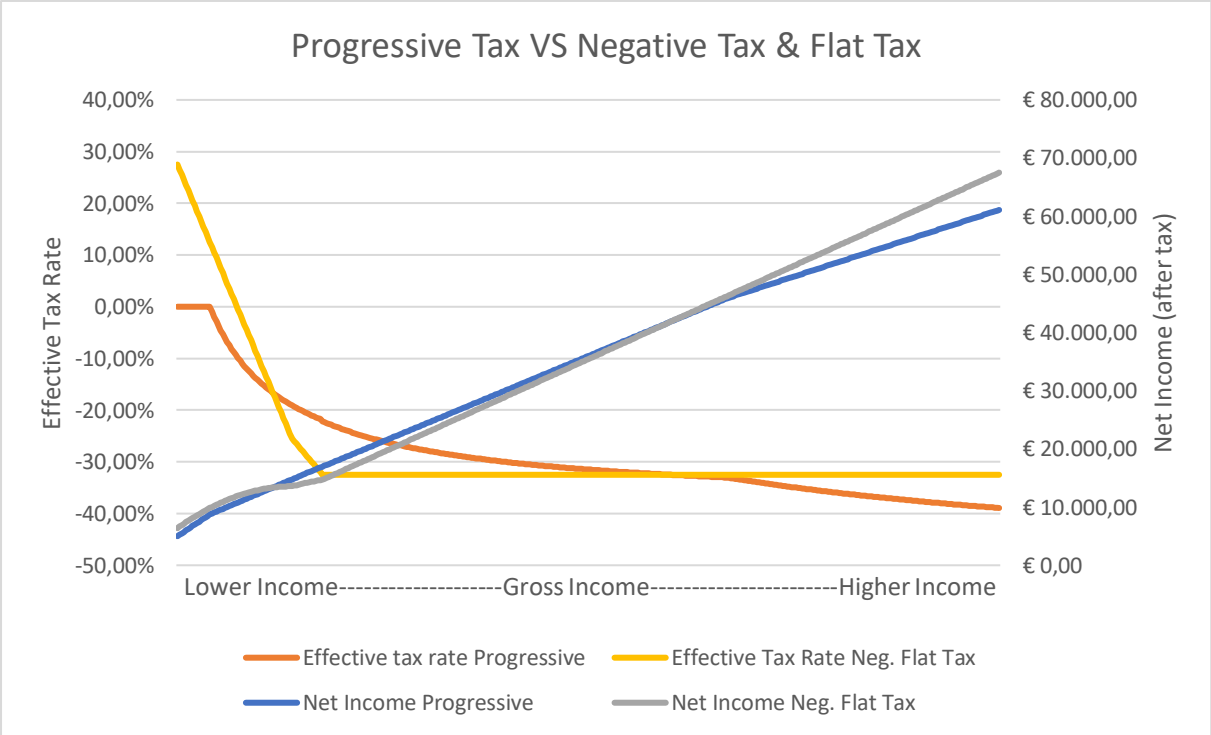

Figure 11 Progressive VS Neg. & Flat Tax (source: Calculation Model Negative & Flat Tax)

In figure 11 an illustration is given that puts the effective tax rates and net incomes of the two different tax systems together. This figure shows how the tax break for the first 8.750 euros initially does not improve the net income of individuals. At a higher income level, the effect of the negative tax starts to decrease while the tax break remains the same, this results in net incomes under the flat tax system falling below the net incomes of the progressive system. This switch occurs at an income level of 13.350 euros. Both net incomes are within a couple hundred euros from each other and slowly close up. This is because the higher tax rates of the progressive system take more from the gross salary compared to the flat tax rate. The net income lines cross around 41.850 euros which means the net income under the flat tax system is higher again.

5 Conclusion

5.1 Introduction

In the conclusion chapter is the analysis about the results from the simulations, the flat and progressive systems have been compared to each other. Based on the analysis, conclusion have been made about the viability of the new tax model compared to the current progressive model. The downsides identified in the literature have been addressed and the disadvantages needed to be mitigated to the point where the flat system becomes a more realistic replacement for the progressive system. The winners and losers under the new system have also been identified, this assists in understanding how the tax burden will shift and what the consequences could be should the negative tax and flat tax be implemented. Finally, an overall conclusion has been formulated, to determine if the negative tax and flat tax system provides a realistic alternative to the current progressive system.

5.2 Paper Conclusion

Under the specific conditions used in the simulation tool, the negative tax and flat tax together are a viable alternative for the current progressive system.

When implementing the new system in practice, likely multiple adjustments and more in-depth calculations are needed with more recent and detailed data. It is assumed that the calculations in this paper are in the right direction but will likely change if better data and more factors are included in the model.

As a result, it should be clear that more future research, more accurate data, all taxes and other relevant factors should be included to further improve and adapt the model to make it useful and accurate in practice. The model presented here only works in the oversimplified system that was used here, this paper does not claim that the new negative tax and flat tax system presented is now a proven concept that is ready to be used.

The answer to the research question:

"Which variation of the 'flat tax' system could be a realistic alternative to replace the current Dutch 'progressive tax' system?" is as followed:

- Within the simulation tool with the variables that are included, there is a case to be made that the combination of a negative tax and flat tax could replace the current progressive system. This is the case because under similar circumstances the revenues are reasonably close at similar tax rates. The negative taxes result in the new system being more favourable for the lowest income levels and if the government increased the negative tax rate and base, it could increase the group of lower income levels that are better off in comparison to the progressive system. This would in theory make the new system 'more' progressive as it is more favourable to the lowest income levels. In short, the new tax system and its tools allow for the government to minimize the income levels that would lose under the negative tax and flat tax.
- It could however not be said that the results of this paper make the proposed new system a 'realistic' alternative. This is mostly because there are still multiple variables that need to be included, more recent and accurate data with more variables to test the new system before it could be considered a 'realistic' alternative. Based on this paper it can be concluded that the proposed combination of negative taxes and a flat tax could be considered a potential 'realistic' alternative to the current progressive tax system used in the Netherlands.

This research and its results are meant as a first step in a process of learning about, adding to, adjusting and improving the new system so that in the future it might be a realistic alternative to be implemented in the real world.

5.3 Conclusion Flat Tax Alternatives

The negative tax and flat tax systems that have been formulated in the calculation model that are the base for the simulations, appear to be a versatile system with multiple variables that allow for adjusting to a policy maker need. The paper has mentioned multiple times that the simulations are an oversimplification to the real world and the result should be treated as such. This should however not take away from the fact that in the specific conditions that have been made in the simulation tool, with the inclusion of the largest tax generators and a new tool for social security, the new tax model appears to work. Tax revenues are comparable with comparable tax rates, there is a tool to mitigate multiple downsides and provide a way to support lower income levels. The largest difference is the exclusion of the large tax break that the progressive system did have.

The simulations have shown that when comparing the different graphs, there does not seem to be many significant differences between the two tax systems. The majority of the tax revenues are still paid by the same income levels and the relative tax burden has not shifted significantly to the poorer income levels. This is mostly due to the negative tax system, which can be further modified to conform to what the policy makers need.

The model has not focussed on the issue of the very poorest outliers and also people with an annual income below 5.000 euros do not receive a negative tax to support them. In reality a special solution needs to be implemented for the very poorest of the Netherlands, but this could not realistically be solved by tax reform with the inclusion of a negative tax system. The negative tax system could have the potential to be further expanded to even lower income levels, both more research would need to be done to adjust the model correctly.

The literature identified downsides of a flat tax system in comparison to a progressive system. The model made in this paper attempts to find a variation of the flat tax system that mitigates some or all of the downsides.

- The lack of progressivity was mentioned because the relative tax burden could be greater for lower income individuals under a flat tax system. This has been mitigated by implementing a negative tax that applies for lower income levels to increase their net income and by reducing the effective tax rate. This negative tax can be adjusted to increase, decrease, expand or shrink to the specific need of the population.
- Less tax revenue for the government would be true under normal circumstances. Under a progressive system tax revenues are (with comparable tax rates) always higher that flat systems, but due to the large tax break that applies under the 2020 progressive system this is not the case. The tax-free income of 8.750 euros slims down the taxable income of everyone, this results in overall revenues being lower than would otherwise be the case. This results in revenues being much closer which makes the potentially lower tax revenue less of an issue.
- The biggest potential disadvantage with a flat tax system is the shift in tax burden to lower income individuals and as a result have lower income individuals stuck in a poverty trap. The negative tax system could potentially solve this (partially) but more future research would be needed to determine how much financial support which income level needs. One advantage compared to the progressive system is that it can be more precise and focussed on the income levels that need it. Making it potentially more affordable compared to a progressive system.

Under the progressive system an individual can earn up to 8.750 euros tax free, because this applies on everyone it becomes a very expensive form of subsidy. This is because this tax break is also available for people with a relatively high income, who do not really need it. When everything is added up these costs an estimated 25.5 billion euros in tax revenue, because even people with higher incomes that don't need the tax break get it. The negative tax provides a more precise tool of subsidising lower income individuals and as a result only costs 3.7 billion (1.5% of total taxable income) in comparable conditions.

Its is should be noted that the negative taxes used in the simulation are not as generous as the tax break that exists under the progressive system, this is because it only focusses on income levels that need the support. If policy makers were to decide more financial support is needed than this could be done with a negative tax. The negative tax and flat tax used in the example in this paper are not right or wrong, it is presented as a viable alternative with similar revenues.

It has been mentioned before how the model is used to simulate both a left leaning and right leaning perspective, to provide the readers with different examples of how the proposed system could be used. By changing the relevant variables to suit either the left or right leaning perspective, it shows that the model is versatile and does not belong to one specific ideology. It is an important aspect of this research to show how versatile the model is because this makes it more likely that it could be implemented in reality, as it is more likely to get support from both sides of the political spectrum.

5.4 Winners & Losers

In the simulations every income class appears to win, the flat tax rate stays below event the lowest tax bracket of the progressive system while still having similar tax revenues. In practice however this is not the case as multiple subsidies and other tax breaks would increase net income and decrease the tax burden of the lower income levels. The tax break that applies for everyone up to 8.750 euros significantly decrease the real effective tax rates on the income levels, this effect is the most prominent with the lower income levels. Figure 10 shows how the net incomes differ marginally between both systems, the differences are as followed:

- The net income levels are higher at the lowest income levels under the negative tax and flat tax. The negative taxes ensure that the lowest income levels receive extra income, this effect decreases as the income increase. This results in the progressive system having marginally higher net income levels between 13.350 euros and 41.850 euros.
- This results in income levels between 13.350 and 41.850 marginally lose under the negative tax system and flat tax system. Every other income level wins compared to the progressive system.

6 Limitations & Future Research

6.1 Introduction

The limitation and suggestions in this chapter are selected based on the subjective opinion of what the writer deems to be the most important. When revisiting the research there were clear limitations in terms of: data used for the research, exclusion of outliers, no ethical considerations, no social considerations. Most of these limitations are a result of the limited resources available for this research, these shortcomings are mentioned with the purpose of having future researchers add to the literature and mitigate the shortcomings of this research. The limitations mentioned in the chapter are the most important in the writer's opinion because they could give more depth and include more variables to the existing research, thus improving and expanding upon the research of this paper.

With the suggestions for future research the writer aims to provide readers with potential starting points to add to this research. As mention in the conclusion chapter, this research needs more additional more in-depth research before the proposed flat tax system could be considered a realistic alternative that could actually be implemented for real. The suggestions are based on the most important limitations of this research (based on the writer's opinion).

6.2 Limitations

- No social groups have been included into the data, this would have been an extra variable which would help to have more accurate predictions on the effects tax reform could have on not just income levels. It could include self-employed people, different taxes apply and this needs to be researched to determine the potential effects of tax reform.
- There is potentially problem with some of the data used because COVID 19 directly affected economic results. This could mean that the data used is not representative of the normal economic and income performance of the Dutch working population.
- There is no consideration made for the income levels below 5.000 euros, this is because tax reform and negative taxation would likely not solve the problem. However, some consideration could have been made and potential solutions researched, which would have made the model more comprehensive.
- No ethical considerations have been made because of a lack of time and resources for this thesis paper. Ethical considerations are important because significant tax reform could have serious implications on every taxpayer's life. In-depth ethical implications need to be researched to ensure an informed decision can be made, with full knowledge of the consequences it could have.
- No social considerations have been made, the social implications of tax reform and its effects have not been considered. This is because of a lack of time and resources for this thesis paper. Social considerations, just like ethical considerations are important when proposing a fundamental change to a tax system that affects everyone on which the tax system applies. Without this research important social issues may not be considered and what impact a change in the tax system could have on these social issues.

6.3 Future Research

In this paragraph future research suggestions are discussed and why they are important additions to the research of this paper. This does not mean that these are the only important additions to the research in this paper, they are based on the writer's opinion and there could be many more potential additions the the research.

Minimal income to satisfy basic needs

This research can be combined with research about how high the minimal income is to satisfy basic needs. This way the negative taxes could be adjusted based on that research to possibly ensure a minimum standard of living for the lower income levels.

Effect of negative taxation on the lowest incomes

How to structure the the negative tax system on the lower end (below 5.000 euros), how much and when does the negative taxation start. And when does the tax base start. There are big questions here with large ethical and social implications. This additional research could mitigate the shortcomings of the research in this paper by taking a closer look and the outliers at the lower end of the income spectrum. This way the addition of specific research into the lower income levels could help adjust the flat tax model to be better suited to replace the existing tax model. The same could be said about the higher end of the income spectrum, this could however also be done by using more accurate data of the higher income levels.

Effect of large differences in tax rates within a progressive system

Is the discussion and contempt that comes with significantly higher tax rates of the progressive system worth the slightly more revenue? What is the actual effect of having large differences in the tax rates between brackets in a progressive tax system? This research would help to structure the tax rates in the new system and help determine what tax rates and differences are considered acceptable by the public.

Long-term wealth growth as a result of more money remaining in the private sector (instead of being paid in taxes)

By having lower tax rates more money would remain in the pockets of tax payers, what long-term effect would this have on the net worth of people. Could this extra money allow people to make more significant investments and/or improve their standard of living? This additional research could help to further support the suggestion that a flat tax system in the long-term creates more wealth and overall improvement of the standard of living for more individuals compared to the social utility of government services and its effect on overall wealth and standard of living.

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