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Girl power! Laughing all the way to the bank: A master thesis looking at the effect of a Dutch tax reform on gender role attitudes and net female labour participation

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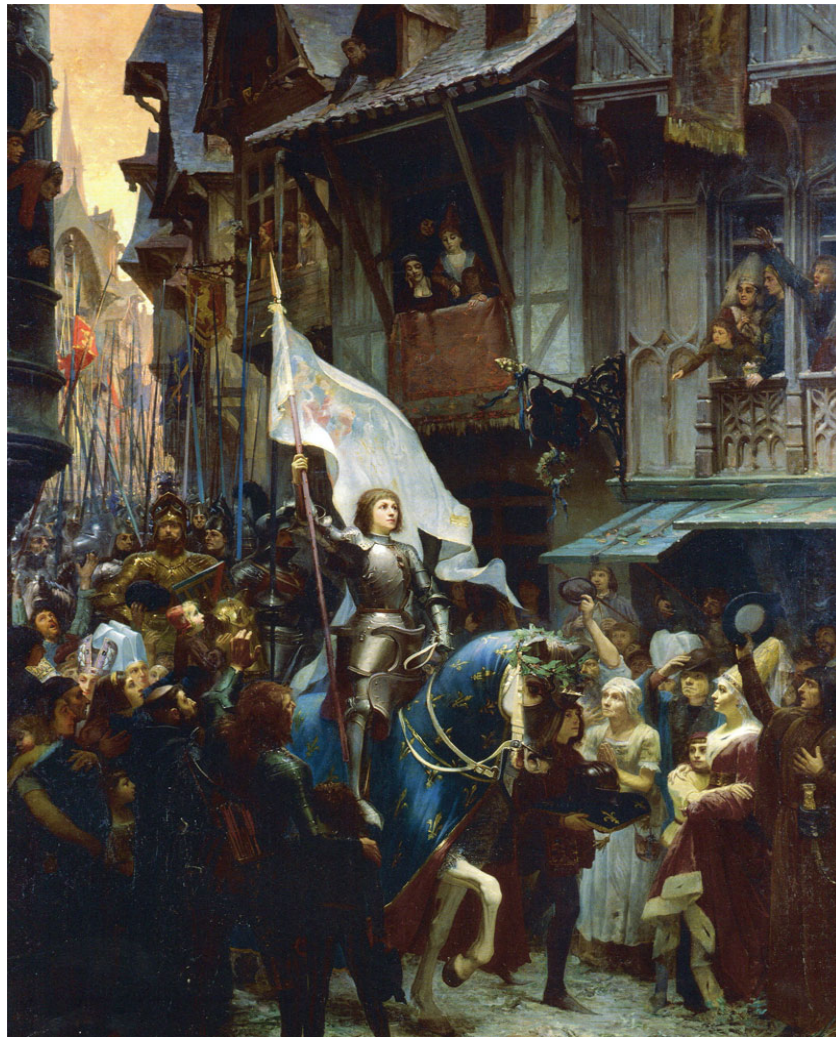
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Girl power! Laughing all the way to the bank

A master thesis looking at the effect of a Dutch tax reform on gender role attitudes and net female labour participation

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French, female hero Joan of Arc enters Orléans during the Hundred Years' War (Scherrer, 1887)

No one can make you feel inferior without your consent

-Eleanor Roosevelt-



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Abstract

This thesis uses data from the LISS Core Study to study the effect of a 2014 Dutch tax reform of labour tax credit on gender role attitudes and female labour participation. Based on a number of regression analyses it is found that the tax reform had no impact on either gender role attitudes or net female labour participation.

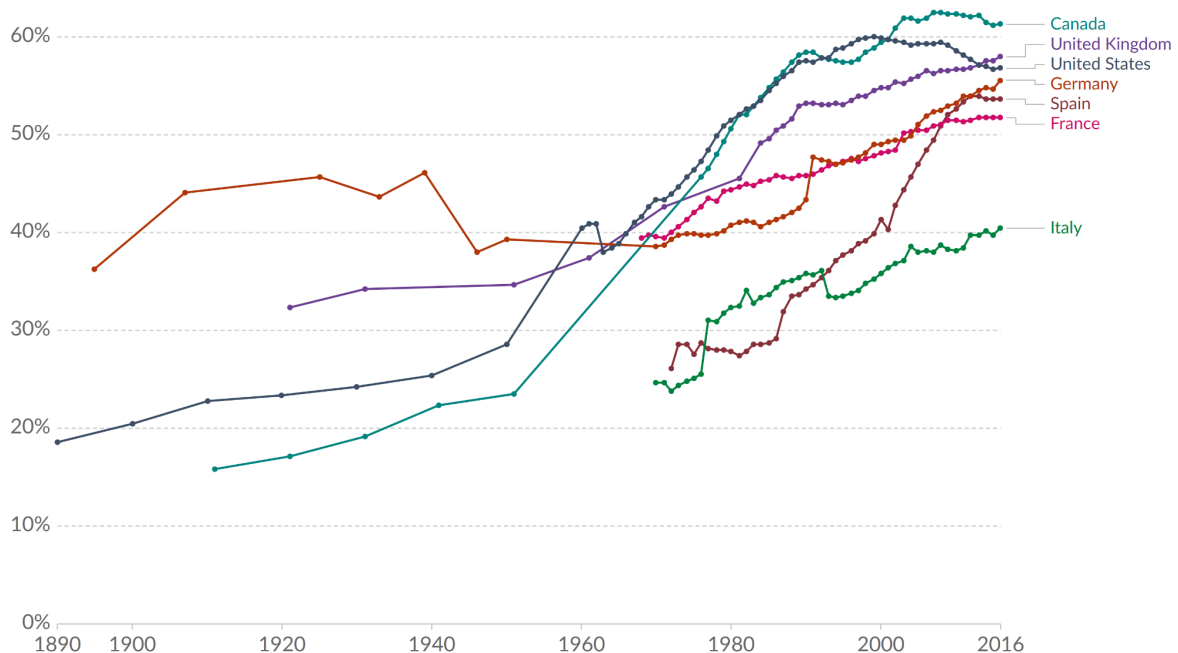
Chapter 1: introduction

The rise in female labour participation (FLP) has been one of the most significant economic developments of the last 100 years. With many early-industrialised countries seeing particularly high growth rates after the end of the Second World War. Figure 1 shows the percentage of the female population ages 15 and over that is economically active. States whose FLP had been rising at the beginning of the 19th century, like Canada, the United States and the United Kingdom, saw female participation rates grow by around 20% - 25% between 1950 and 1990 (Our World in Data, 2018). Changes on both the supply and the demand side of the labour market attributed to this. Particularly when it came to the labour participation of married women (Costa, 2000; Our World in Data, 2018; Fernández, 2013).

On the supply side, higher education levels, lower fertility rates, technological advances in appliances, changing social norms, and individual preferences on all of the above have made women more willing to enter the labour market. On the demand side, structural economic changes like the rise of clerical and sales sectors, the growth of (the availability of) part-time work and equal rights legislation have made it easier for women to find work (Vlasblom & Schippers, 2004; Thévenon, 2013; Costa, 2000; Cardia & Gomme, 2013; Goldin, 2006).

Figure 1

Gross Female Labour Participation Rates in Early-Industrialised Countries, 1890 - 2016



Source: Our World in Data (2018)

However, a new development one might be able to discern from figure 1 is that the growth in FLP slowed down significantly around the start of the 21st century. With the exception of Spain, whose FLP continued to climb steadily up until 2009, most early-industrialised countries saw their FLP growth rates slow. Usually starting around the early 90's (Our World in Data, 2018; Klasen, Le, Pieters & Santos Silva, 2021). Canada, the United Kingdom and France saw their FLP grow by between 3% - 5% between 1990 and 2015. With the US even seeing its participation drop by 1%. Germany and the Netherlands fared significantly better, with their FLP growing by around 10% and 13% respectively in this period. Although the latter has seen its growth plateau beginning around 2010.

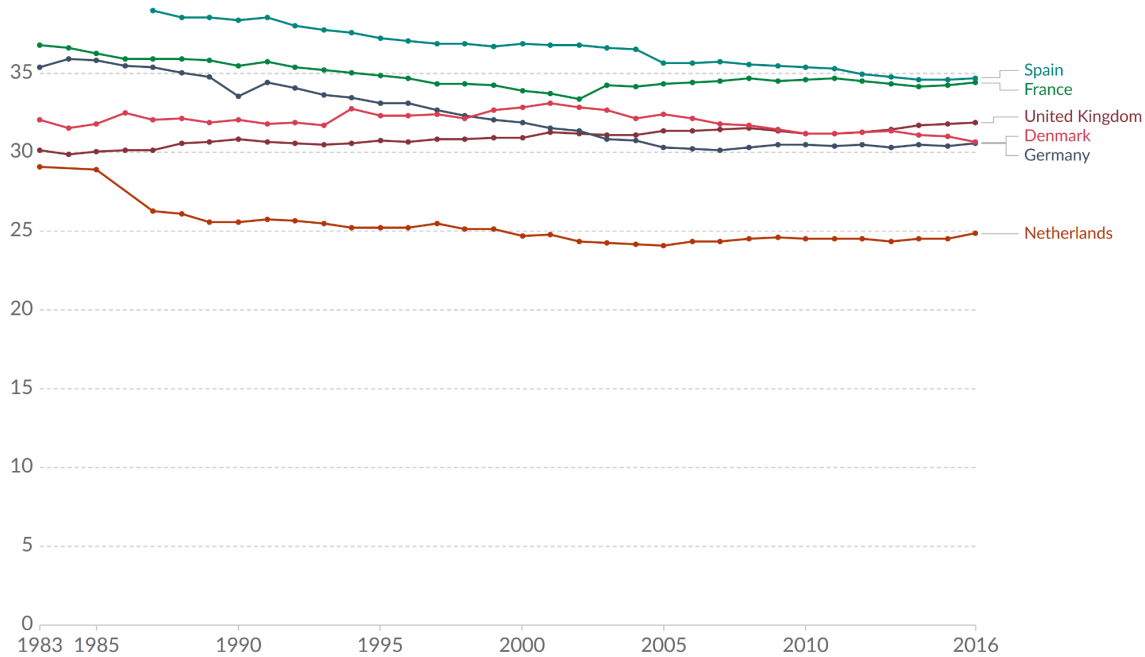
But figure 1 only shows part of the recent developments in female participation, as it only analyses what is called gross labour participation. Defined as the percentage of a country's population who are either employed or unemployed (actively looking for work). Looking at other aspects like net labour participation and gender role attitudes, provides further insight into recent trends. Starting with the former, defined as the average amount of weekly working hours a person makes (Our world in Data, 2018; Boeri & Ours, 2013; Huberman & Minns, 2007). Figure 2 shows the net FLP in a number of Western countries for women ages 15 and over.

In contrast to gross participation rates, female net participation has either barely changed or dropped slightly in many countries. Women in Spain, Germany and the Netherlands work about 4 - 5 hours less in 2016 than they did in 1983. Whereas in the United Kingdom, Denmark and France working hours have changed by barely 1 or 2 hours in that 33 year time frame (Our World in Data, 2018). In further contrast to gross participation rates, developments in net participation do not appear to have changed significantly since the start of the new century. (Our World in Data, 2018; Thévenon, 2013; Klasen et al., 2021).

Most of the explanation as to why a (slowing) growth in gross FLP between the 1980's and 2016 seems to have gone hand in hand with a stagnation or slight decrease in net FLP, is given by the fact that an important demand side factor of the rise in gross FLP was growth in (the availability) of part-time work. A significant part of the women who entered the labour market during the 1970's, 80's and 90's entered with part-time jobs. Providing downwards pressure on net participation rates (Our World in Data, 2018; Costa, 2000; Fagain, 2014).

Figure 2

Net Female Labour Participation Rates in Several Western Countries, 1983 - 2016



Source: Our World in Data (2018)

Another aspect of female participation are so-called gender role attitudes. Defined as an individual's cognitive representation as to the appropriate roles for women and men. For example when it comes to female labour participation. During the last 40 - 50 years, developments on this front have been relatively similar to those of gross FLP. Support for egalitarianism (gender equality), be it in terms of equal pay, opportunity or treatment, grew significantly during the 70's, 80's and early 90's (Lomazzi & Seddig, 2020; Boehnke, 2011; Our World in Data, 2018).

In the mid-90's however, growth slowed way down. Seemingly followed by a resurgence beginning around 2004. Although growth rates during the last 15 years seem to be lower than those of the 70's, 80's and 90's (Shu & Meagher, 2017; Knight & Brinton, 2017; Thijs, Grotenhuis, Scheepers & van den Brink, 2019). In the US for example, Scarborough, Sin & Risman (2018) found that support for egalitarian roles jumped from around 22% to 58% between 1977 and 1995. Followed by a drop, bringing support down to 43% in 2000. Followed by a slow climb bringing support up to 69% in 2016 (Meagher & shu, 2019).

The academic explanation for why gender role attitudes developed in this fashion, particularly when it comes to the stall and subsequent rise from the mid-90's onwards, isn't

uniform. Where most seem to agree that many of the cultural and structural developments mentioned on page 1 as explanation for the rise in gross FLP, like lower fertility rates and higher education levels, also attributed to an increase in support for egalitarianism, many can't agree of the specific reasons for the so-called stalled gender revolution (Shorrocks, 2016; Meagher & Shu, 2019; Knight & Brinton, 2017). However, academic interest seems to have focused on social factors in search of an explanation. Examples of factors which are being proposed as possible reasons include increased overwork among men (reinforces traditional division of household tasks), a split of egalitarianism into hybrid categories (not a drop, but a splintering of support) and discourse during childhood (Luke, 2019; Pepin & Cotter, 2017; Thijs et al., 2019).

In order to fully grasp the developments in FLP across Western/early-industrialised countries, it might be helpful to briefly look at the changes in gross & net FLP, and gender role attitudes in a specific country. Take the Netherlands for example. Between 1970 and 2000, Dutch gross FLP grew from approximately 35% to 57%. But, following the common trend mentioned earlier, gross FLP only increased to around 67% during the last two decades. Second, again following international trends, net FLP stayed nearly identical between 1990 and 2020. Hanging around 25 - 26 working hours a week (Central Bureau for Statistics, 2021a; Our World in Data, 2018).

Lastly, developments in gender role attitudes seem to mirror global ones, although exact data on the matter is relatively scarce for the Netherlands. Nonetheless, looking at for example public support for the idea that women are better at taking care of children than men seems to follow international trends. With support dropping from around 50% to 37% between 1981 - 1995. Followed by a slight increase to 41% between 1995 - 2005, and a subsequent drop to 28% in 2020 (Central Bureau for Statistics, 2020; Thijs et al., 2019).

But why is it relevant to look at female participation? Why does it matter that its growth seems to be slowing during the last three decades? The answer to both of these questions is that behind these developments lies public policy. Many countries, for different reasons, have implemented policies aimed at stimulating female participation. Particularly when it comes to their labour participation. Examples of these kinds of policies include tax-transfers, childcare subsidies, and parental leave programs (Kenjoh, 2005; Hérault & Kalb, 2020; Richardson, Pacelli, Poggi & Richiardi, 2018; Thévenon, 2013).

Interestingly, it seems that especially during the last 10 - 15 years these policies haven't had much effect. Or at the very least, their effectiveness seems to be dropping. This raises the question, which is both academically and politically relevant, as to why these kinds of policies haven't been as effective. Is it because they were doomed from the start? Perhaps born out of outdated ideas and/or research on the main determinants of female participation. Or have they been effective, but simply limited in their effectiveness as a result of budgetary limitations? Or have they been relatively effective, but overshadowed by other determinants of participation which have been ignored or overlooked by academics or policy makers?

All of these questions have a common theme. They bring interest to analysing these policies, and find out what their effect has been on the behaviour of people. Both in order to evaluate their effectiveness, but also to look at their broader impact on society. As most of these policies are aimed at specifically stimulating FLP, this results in a need to analyse their effects on gross or net labour participation, and other social concepts like gender role attitudes. Such an analysis fits well into the capstone for which this thesis has been written. Its goal being to evaluate policy and study its effects on human behaviour, specifically using micro-data.

The goal of this thesis is to study the effect of a specific policy change on both gender role attitudes of individuals (men and women), and the net labour participation of specifically women. The policy change is a 2014 tax reform in the Netherlands in which the amount of labour tax credit (*arbeidskorting*) was significantly increased for citizens whose income from labour was higher than €12.000/year. Compared to the group making less than €12.000/year, whose amount of labour tax credit wasn't changed significantly. For this research the author collected micro-level, survey data on Dutch households from the LISS Core Study between 2012 - 2015. Using a Differences-in-Differences (DiD) regression analysis of two groups, one with treatment (higher labour tax credits) and one without, the thesis aims to study the effect of this independent variable on two dependent variables. Namely gender role attitudes & net female labour participation. In addition, a large number of control variables looking at factors like level of education, age, social background, religiosity, fertility, marital status, et cetera (see chapter 2) are included in the analysis. The research question is:

What is the effect of the 2014 Dutch tax reform on gender role attitudes and net female labour participation?

The decision to focus specifically on analysing the effect of Dutch policy on gender role attitudes and net female labour participation requires a deeper look into the academic and social relevance of such research. First, why might one expect that the research of this thesis is going to add to the existing scientific literature on FLP? Secondly, why would such research be of benefit to current or future decision-making by policy makers as to how best to stimulate FLP? Both of these questions will be answered in the following two parts of chapter 1. Starting with the former, academic relevance, and moving on to the latter, social relevance.

Academic relevance

Research into participation isn't rare. The existing body of literature is extensive, and interest in for example researching FLP and its recent developments has jumped as a result of a drop in female participation in the United States (see figure 1). Which began around the turn of the century (Richardson et al., 2018; Herault & Kalb, 2020; Thévenon, 2013). However, within the wider area of participation research one can identify two groups relevant for the subject of this thesis.

The first looks at the actual level of participation, for example in terms of labour. Which, in light of recent developments (see introduction), regularly focuses on the labour participation of women. And another group, looking at the opinions of both men and women on the appropriateness of participation. In other words, opinions on gender role attitudes (Aaronson, Dehejia, Jordan, Pop-Eleches, Samii, & Schulze, 2020; Altuzarra, Gálvez-Gálvez & González-Flores, 2019; Herault & Kalb, 2020). The first of these groups will now be analysed further.

Zooming in, a significant part of the literature looking at labour participation focuses on studying a number of subjects. First, the so-called U-hypothesis on the relationship between economic development and FLP. This hypothesis states that as a country begins to grow in terms of its economic development it will first see its FLP drop, but as development gets higher and higher FLP will begin to rise. Following an U shape. (Altuzarra et al., 2019; Klasen et al., 2021; Pal & Chaudhuri, 2020).

Whilst a significant amount of empirical research has provided evidence in favour of this theory, a growing number of studies have been published during the last 10 years which provide more conflicting evidence. For example, Besamusca, Tijdens, Keune & Steinmetz

(2015) found that the U-hypothesis has high explanatory power for women aged 20 - 24 and 55 - 59, but less so outside of those age categories. And more research like this has been coming out. Adding, at the very least, more nuance to the existing hypothesis (Klasen et al., 2021; Gaddis & Klasen, 2013; Aaronson et al., 2020).

Another part of this literature focuses on identifying the main determinants of female labour participation. So what specific factors seem to have the largest impact on a woman's decision to enter the labour market (gross labour participation), and how many hours she works (net labour participation). Three subgroups of research can be identified here. One that focuses on analysing the effect of personal and demographic factors, like changes in fertility and the level of education (Pena-Boquete, 2015; Cipollone & D'ippoliti, 2011; Pal & Chaudhuri, 2020; Shittu & Abdullah, 2019). With the latter confirmed by a large number of studies as being very important in explaining FLR (Eckstein & Lifshitz, 2011; Cipollone & D'ippoliti, 2011; Kenjoh, 2005; Altuzarra et al., 2019; Klasen et al., 2021; Pena-Boquete, 2015; Vlasblom & Schippers, 2004).

The second subgroup focuses on analysing financial factors, like changes in participation tax rates and childcare benefits (Kenjoh, 2005; Herault & Kalb, 2020; Richardson et al., 2018; Bick & Fuchs-Schündeln, 2017). Research in this area is often directly connected to public policy, in that authors look at cross-country differences in these kinds of financial incentives in order to study their effects on FLP (Richardson et al., 2018; Kenjoh, 2005; Thévenon, 2013; Thévenon, 2015; Kalíšková, 2018).

Although studying this relationship isn't a new venture, most contemporary studies in both of the subgroups, particularly those conducting comparative country analyses, seem to focus on analysing gross labour participation and not net. Which limits their explanatory power in terms of the effectiveness of different financial factors (Herault & Kalb, 2020). This gap provides the first point of academic relevance for one of the two dependent variables. As it is the goal of the author to look at the effect of a financial incentive the Dutch government has implemented to stimulate FLP on net labour participation specifically (Ministry of Finance, 2013).

The final subgroup focuses on analysing the effect of social and cultural factors, like religiosity and social norms (Cipollone & D'ippoliti, 2011; Fernández, 2013; Khoudja &

Fleischmann, 2014; Fortin, 2015; Guetto, Luijkx & Scherer, 2015; Khoudja & Fleischmann, 2017). Studies looking into the effect of these kinds of factors are a relatively new phenomenon, with many coming out in the last decade. An increased effort for which especially Raquel Fernández (2013) can be pointed to in terms of being a main driver.

However, despite the fact that social and cultural factors have been found to have a significant impact on FLP, this area of research hasn't been applied much in combination with the other two groups mentioned before (Cipollone & D'ippoliti, 2011; Fortin, 2015; Guetto, Luijkx & Scherer, 2015; Camussi, 2013). This provides the second point of academic relevance. As it is the goal of the author to add variables like religiosity and social background to its analysis of the financial incentive of labour tax credit in the form of control variables.

Zooming back out to the wider area of participation research, the other group mentioned at the top looking at gender role attitudes also needs to be analysed briefly. Academic relevance for this particular dependent variable is built on two pillars. Just like research into female labour participation, studies looking at gender role attitudes and its developments aren't rare. Although older research, talking 70's, 80's and to a certain extent the 90's, seems to have focused on gender in the broader sense of the word. As opposed to specifically looking at gender role attitudes (Biddle, 1986; Acker, 1992; Beere, C., King, Beere, D & King, 1984).

Though contemporary research has moved away from this, it still regularly suffers from a small definition problem. For example, a study might only use one survey question asking a respondent whether he/she thinks women are better at taking care of children than men (Walter, 2018; Luke, 2019; Thijs et al., 2019). This provides the third point of academic relevance. As it is the goal of the author to use the LISS Core Study data to look at a number of survey questions related to a respondent's attitudes on gender roles.

The second point of academic relevance is related to the type of data that regularly gets used in these kinds of studies. Which often look at developments in gender role attitudes over long periods of time, based on cross country. Using datasets like the European and/or World Values Surveys (Luke, 2019; Knight & Brinton, 2017; André, Gesthuizen & Scheepers, 2013; Hudde, 2018). A common problem of these kinds of analyses though, is that they are built on the assumption that people in different countries, with different social and cultural settings,

will interpret questions about gender role attitudes in the same way. Which might not always be the case (Lomazzi & Seddig, 2020; Walter, 2018).

This is part of the reason why other authors have moved to researching gender role attitudes, and its main determinants, in country specific settings (Kretschmer, 2017; Khoudja & Fleischmann, 2017; Siordia, 2016). This is not to say that this kind of research doesn't have its own drawbacks. An obvious one is that research of this kind has limited explanatory power outside of the country that it was conducted in. Although, it can be argued that studies like these are more useful for researchers trying to identify causal mechanisms. As dealing with one single country often makes it easier to add additional (control) variables to an analysis, then it would be when dealing with a large number of states (Luke, 2019; Scarborough et al., 2018; Hu & Scott, 2014). This provides the fourth point of academic relevance. As it is the goal of the author to analyse a possible determinant (labour tax credit) of gender role attitudes in a specific country, with the addition of a large number of other factors as controls.

But, given these four points of relevance, why is it logical to specifically look at the Netherlands? In truth, there is no big factor preventing the kind of research that is being proposed from being conducted in another country. Although, given the Western nature of many of the articles cited up to this point, it would probably be preferable to look for candidates in either North-America or Europe. There are however a number of smaller reasons for why the author has decided to focus on the Netherlands.

The Dutch LISS Core Study data is familiar to the author as being a reliable and useful dataset. In addition, the data meets an important capstone requirement of needing to look at micro-data. Lastly, the dataset is very up to date and rich. Particularly the latter is important in regards to the first point of academic relevance for looking at gender role attitudes.

Allowing the author to look at multiple aspects of the concept. Benefits of the former are related to the fact that this kind of contemporary data allows for an analysis of net female labour participation in the middle of the plateauing/drop as mentioned at the start of this chapter. These factors, in combination with the four points of academic relevance, have led the author to decide to study the impact of an increase in labour tax credit on gender role attitudes and net female labour participation using micro data in the Netherlands.

Social relevance

Explaining why, from a societal perspective, it is relevant to look at the effect of the 2014 Dutch tax reform on gender role attitudes and net female labour participation comes down to one thing: an ageing population. Like many Western countries, the Netherlands has seen, and is projected to see, the elderly become a larger share of its population. The Netherlands Interdisciplinary Demographic Institute or NIDI (2021) has projected that by 2050 the percentage of the Dutch population which is over the age of 80 will double. Whilst the amount of working people will drop by around 3%. Leading to increased economic pressure as a shrinking group of workers is expected to finance the healthcare costs and social spendings for a growing group of elders (NOS, 2021; Central Planning Bureau, 2019).

The NIDI (2021) lays out that to prevent this increase in economic pressure from exceeding acceptable levels, the Netherlands needs to counter these pressures with an increase in labour migration, later pensions (people need to work longer) and higher FLP. In terms of both gross, but also net labour participation. As the Netherlands continues to be a leader in part-time work (Central Bureau for Statistics, 2020).

However, there is no clear answer as to how this can best be achieved. With policy options including increasing childcare benefits or lowering taxes on labour (Central Bureau for Statistics, 2015; Central Planning Bureau, 2011; Central Planning Bureau, 2019). But support for egalitarian gender roles have also been discussed in this context. As being a development which needs to take place alongside higher net labour participation (House of Representatives, 2020).

The social relevance of this thesis is directly related to this policy decision. The research can serve as both an evaluation as to how effective current governmental policy has been in achieving higher net female labour participation, and as a source of knowledge for future policy-makers as to which specific policies are likely going to be able to achieve a significant increase in FLP. With the latter being even more important right now. As two of the main political parties expected to become part of the next administration, namely D66 (2020) and the VVD (2020), have expressed their intentions of wanting to stimulate FLP by lowering (labour) taxes and increasing childcare benefits. Making an evaluation of these specific fiscal policies even more socially relevant.

Structure

The rest of the thesis is set up as follows. Chapter 2 reviews the current scientific literature, provides a theoretical framework, and presents hypotheses for the relationship between labour tax credit, gender role attitudes and net female labour participation. Chapter 3 explains the research design and discusses its limitations. Chapter 4 presents the empirical findings. Chapter 5 concludes by looking at the core findings of the research, gives recommendations and answers the research question.

Chapter 2: theoretical framework

This chapter presents the theory used for the thesis. The research of this thesis revolves around three main phenomena: 1) gender role attitudes, 2) labour tax credit, and 3) net female labour participation. The goal of this chapter is to use scientific literature to convert these phenomena into specific concepts which can be analysed using data from the LISS Core Study, in order to answer the research question. Furthermore, the literature is used to predict the potential (causal) relationship between the independent and dependent variables.

First, gender role attitudes are conceptualised. Second, labour tax credit is conceptualised and the possible relationship between these two concepts is analysed. Third, net female labour participation is conceptualised. Fourth, the possible relationship between it and labour tax credit is studied. For both of these relationships an alternative hypothesis (H_a) will be presented. Lastly, attention is given to the control variables. Their expected relationships with both gender role attitudes and net female labour participation will be examined.

Taxes and gender role attitudes

Gender role attitudes

An analysis of the relationship between taxes and gender role attitudes should start by providing a definition and conceptualisation of both. Starting with gender role attitudes. As mentioned in chapter 1, gender role attitudes are defined as the cognitive representation of an individual as to what constitutes an appropriate role for men and women. Often touching upon topics like labour force participation, division of household tasks and child care (Lomazzi & Seddig, 2020; Boehnke, 2011; Our World in Data, 2018; Hudde, 2020; Deole & Zeydanli, 2021).

In terms of defining and conceptualising gender role attitudes, the literature on the matter has gone through significant changes during the last few decades. Although recent studies looking at gender role attitudes can be found in many of the social sciences, including public administration, the roots of the research lie in social psychology (Walter, 2018; Fortin, 2015). Two important theoretical developments, which took place between the 1970's and now, are relevant to mention here. Namely, the creation of the concept of gender role attitudes from research looking at the concept of gender, and the distinction between gender role attitudes and gender stereotypes. (Walter, 2017; Baber & Tucker, 2006; Walter, 2018).

If the contemporary social discourse around it is any indication, gender is a very difficult concept to define. However, an important theoretical attempt was made during the late 70's and 80's using what is called role theory. Which attempted to define gender by describing it as one of the many roles that make up an individual's social identity. This identity in turn determines how an individual will behave in a given social situation. (Biddle, 1986; Acker, 1992; Beere, C., King, Beere, D & King, 1984). So, just like one might decide to behave a certain way at work because he/she is an employee, one behaves a certain way given his/her "role" as a member of one of the two sexes (Walter, 2018).

Despite critics arguing against the theory, mainly criticising it for being unable to fully capture what it means to be of a certain gender & not being particularly useful in describing and explaining gender inequality, it served as a foundation for many other kinds research (Risman & Davis, 2013; Acker, 1992; Walter, 2018). Including research into gender role attitudes. Using the role theory definition of gender, gender role attitudes were defined as the ideas that a society assigns to people as to how they should behave given their role as being one of the two genders (Davis & Greenstein, 2009; Bartley, Blanton & Gilliard, 2005).

This conceptualisation touches upon the second development in this field of research. Namely that the concept of gender role attitudes is regularly mixed up with the concept of gender stereotypes (Davis & Greenstein, 2009; Ellemers, 2018; Grau & Zotos, 2016). Which might seem logical. Because do gender stereotypes not fit the definition of being ideas about how an individual of a certain gender should behave in a given situation? There is however an important difference between the two.

Namely, gender stereotypes are descriptive in nature, whilst gender role attitudes are prescriptive. This means that the former is used to explain the latter (Walter, 2018; Olsson & Martiny, 2018; Diekmann & Goodfriend, 2006). For example, the gender stereotype that women are more sensitive than men might explain why people have the gender role attitude of thinking that women are better at taking care of children than men. Gender stereotypes are not gender role attitudes, but ways through which the latter can develop or propagate (Walter, 2018).

The historical roots of the concept, and the difference between it and gender stereotypes, are important to keep in the back of one's mind. Both when analysing the concept itself, but also

when looking at its place in the field of public administration and other social sciences. This place can be explained further by looking at another, more recent, development: the distinction between gender role attitudes in the public and private sphere (Scarborough et al., 2018; Knight & Brinton, 2017; Walter, 2018).

Though one might expect an individual with ideas about what constitutes an appropriate role for men and women to apply these equally to all social situations, this does not seem to be the case. Recent research shows that people have different views on gender roles based on the social context they are in (Scarborough et al., 2018; Lomazzi & Seddig, 2020; Dotti Sani & Quaranta, 2016). One might for example believe that men and women both need to provide income for their households, but also believe that a working mother can't develop a close bond with her children.

The former is seen as part of public gender role attitudes, which are related to community, public office and occupational settings. The latter is seen as part of private gender role attitudes, which are related to partnership and parenthood (Walter 2018; Walter, 2017; Scarborough et al., 2018; Knight & Brinton, 2017). This split in the concept provides a possible pitfall for researchers. Because when one doesn't make a clear distinction between these two when conducting research, it can distort results (Goldscheider, Bernhardt & Lappgård, 2015; Constantin & Voicu, 2014; Luke, 2019; Dotti Sani & Quaranta, 2016).

An example of this was mentioned in chapter 1, when discussing the possible reasons for the plateauing of growth in support of egalitarian gender roles during the mid-90's. Knight & Brinton (2017) argue that researchers failing to account for growing differences in people's ideas about appropriate gender roles in public and private spheres could help to explain this. Put simply, it's not that people started to believe less in the idea of egalitarian gender roles. They could however have started to have different views in the workplace, then they did at home (Knight & Brinton, 2017; Walter, 2018; Lomazzi & Seddig, 2020; Scarborough et al., 2018). It is argued that this development necessitates any research looking at gender role attitudes to make a clear distinction between public and private attitudes.

An extension to this point, which was brought up in the discussion of academic relevance, is the need to base one's conceptualisation of gender role attitudes on multiple points of data. Given the fact that survey data is the most common source of information on gender role

attitudes, this implies that one should try to base their concept of public and private gender role attitudes on several questions (Walter, 2018; Luke, 2019; Thijs et al., 2019). For example, when looking at public attitudes, one should include questions that look at an individual's convictions about whether men and women should both provide household income, and/or the appropriateness of having a female superior (Walter, 2018).

Labour tax credit

In contrast to gender role attitudes, the phenomena of labour tax credit is a bit easier to define and conceptualise. Boeri & Ours (2013) describe it as a discount on an individual's due taxes based on his/her level of income from labour. Which in term is based on wage and the amount of working hours Given this definition, it would seem that labour tax credit should be placed under the larger theoretical umbrella of the concept of taxation on labour (Motiejunaite & Kravchenko, 2008; Lundqvist, 2017; Kopf & Zabel, 2016).

However, based on the direction of the research of this thesis, it is argued that labour tax credit fits better within the larger concept of family policy institutions. A concept which looks at whether a country's tax system tends to favour either a single-earner, or a dual-earner household (Sjöberg, 2004 ; Stickney & Konrad, 2012; Avdeyeva, 2006). Labour tax credit can then be seen as one of many kinds of taxation which can differ in its level of favourability (more tax credit) between, for example, a married couple or a single-mother (Stickney & Konrad, 2012).

But why do countries have different levels of tax favourability in the first place? The main logic behind this concept is that governments may want to support or stimulate specific social groups. An important example here are parents with young children (Avdeyeva, 2006; Lundqvist, 2017; Kopf & Zabel, 2016). Because parenthood tends to be rather physically and mentally draining, many individuals with young children will decide to work less.

If a government decides that it finds this unfavourable, it can decide to counter this by, for example, increasing the amount of tax credit both parents can earn for an extra hour of work (Stickney & Konrad, 2012). However, this creates a gap between the level of taxes paid by a single-earner, compared to a dual-earner household making the same amount. Within this theoretical context, labour tax credit can be conceptualised as a kind of fiscal policy which influences the division of tax favourability between different kinds of households (Stickney & Konrad, 2012; Sjöberg, 2004; Motiejunaite & Kravchenko, 2008).

An observant reader might have already spotted the possible relationship this concept could have with gender role attitudes. Since, if a country for example raises the amount of labour tax credit all citizens can earn, two-earner households might decide that in order to reap the more benefits both members should work more. Which can boost egalitarian ideas about gender roles within the household. Empirical research that supports this possible relationship can be found in the scientific literature. Both in terms of public and private gender role attitudes, an increase in the amount of labour tax credit has been found to have a causal relationship with the support for egalitarian gender roles (Stickney & Konrad, 2012; Sjöberg, 2004; Motiejunaite & Kravchenko, 2008; Avdeyeva, 2006; Lundqvist, 2017; Kopf & Zabel, 2016). Based on this, the following alternative hypothesis on the relationship between labour tax credit and gender role attitudes can be given:

H_{a1}: An increase in the amount of labour tax credit an individual earns will make the public and private gender role attitudes of the individual more egalitarian.

Labour tax credit and net female labour participation

The last phenomena of this thesis which needs to be defined and conceptualised is net female labour participation. Out of the three phenomena mentioned at the top of this chapter, this one is likely to be the easiest to define and conceptualise. As mentioned in chapter 1, net female labour participation is defined as the amount of average working hours a woman makes (Our world in Data, 2018; Boeri & Ours, 2013; Huberman & Minns, 2007). The only relevant theoretical context that can be discussed here is the fact that historically, research into net labour participation has been overshadowed by gross labour participation research (percentage of employed and unemployed people). Both in the general field of research looking into labour participation (both men and women), as well as in the field of research specifically looking at female labour participation (Rendall, 2018; Klasen et al., 2021; Chakraborty, Holter & Stepanchuk, 2015).

Only during the last few decades have studies looking at net female labour participation and its main determinants moved to the foreground. With one possible determinant, in terms of public policy, being of particular relevance to this thesis. Namely, the effect of labour taxation (Bick & Fuchs-Schündeln, 2017; Thévenon, 2013; Herault & Kalb, 2020; Crossley & Jeon, 2007). This connects directly with the concept of labour tax credits. Which makes sense, since one of the main ways governments can try to stimulate labour participation by making

it work more worthwhile is by lowering the tax burden on labour. And empirical research has found a causal relation between the amount of labour tax credit and net female labour participation (Thévenon, 2013; Klasen et al., 2021; Bick & Fuchs-Schündeln, 2017; Herault & Kalb, 2020; Chakraborty, Holter & Stepanchuk, 2015; Rendall, 2018). Based on this, the following alternative hypothesis can be given:

H_{a2} : *An increase in the amount of labour tax credit a woman earns will increase the amount of working hours she makes.*

Control variables

Having analysed and conceptualised both the independent variable and the two dependent variables, it is time to move to the control variables used for the research. These are the factors that, based on a review of the scientific literature, are expected to have an impact on gender role attitudes and net female labour participation. A total of 7 factors have been identified as being important factors in determining outcomes for either, or both of the dependent variables.

They are: 1) education, 2) religion, 3) age, 4) cultural background, 5) employment status, 6) family composition, and 7) marital status. The goal of this section is to try and answer the following question: *why are these factors expected to have an effect on gender role attitudes and net female labour participation, and what kind of an effect are they expected to have?*

Education

The first control variable for both gender role attitudes and net female labour participation is education. This factor has been identified by a very large number of studies as being of extreme importance in determining outcomes for both of the dependent variables. For gender role attitudes it is expected that as the level of education rises, an individual's attitude toward gender roles will become more egalitarian (Thijs et al., 2019; André et al., 2013; Knight & Brinton, 2017; Siordia, 2016; Walter, 2018; Shu & Meagher, 2017).

The reasoning behind this relationship is that higher levels of education are associated with an increased openness to opposing viewpoints, and contact with ideas about equality and diversity. Both of which help to counter traditional stereotypes about gender roles. Studies have found that in terms of both public and the private sphere, higher levels of education are

associated with more egalitarian gender role attitudes. This effect is expected to be large (Hu & Scott, 2014; Meagher & Shu, 2019; Pepin & Cotter, 2017; Scarborough et al., 2018; Shorrocks, 2016; Boehnke, 2011).

For net female labour participation it is expected that as her level of education increases, a woman will work more hours (Altuzarra et al., 2019; Besamusca et al., 2015; Bick & Fuchs-Schündeln, 2017; Attanasio, Low & Sánchez-Marcos, 2008; Boeri & Ours, 2013; Cipollone & D'ippoliti, 2011; Costa, 2000; Eckstein & Lifshitz, 2011; Fagan, 2014; Gaddis & Klasen, 2013). The reasoning behind this is that higher levels of education are associated with an increase in so called opportunity costs of leisure.

Meaning that as a woman becomes more highly educated, the economic benefit of an additional hour of work in terms of more income becomes higher and higher. Studies have found that this increase in opportunity costs stimulates women to work more (Filler & Jennings, 2015; Kalíšková, 2018; Kenjoh, 2005; Khoudja & Fleischmann, 2014; Klasen et al., 2021; Pena-Boquete, 2015; Richardson et al., 2018; Shittu & Abdullah, 2019; Thévenon, 2013; Vlasblom & Schippers, 2004).

However, it is important to point out that the relationship between education and the two dependent variables, to an extent, also works in the opposite direction. Meaning that as the level of education drops, particularly if a person is very lowly educated (secondary level of education or lower), their gender role attitudes will become more traditional and they will work fewer hours (Thijs et al., 2019; André et al., 2013; Shu & Meagher, 2017; Pepin & Cotter, 2017; Herault & Kalb, 2020; Altuzarra et al., 2019; Besamusca et al., 2015; Bick & Fuchs-Schündeln, 2017).

Religion

The second control variable for both gender role attitudes and net female labour participation is religion. This factor has been identified by a number of studies as being of strong importance in determining outcomes for both of the dependent variables. For gender role attitudes it is expected that if a person is religious, his/her attitude toward gender roles will be more traditional (Thijs et al., 2019; André et al., 2013; Knight & Brinton, 2017; Siordia, 2016). The reasoning behind this is that the three main Western religions (Judaism, Christianity, and Islam) all promote the idea that men and women are fundamentally

different, and that there is an ideal kind of family tradition one needs to adhere to. This effect is expected to be large (Pepin & Cotter, 2017; Shorrocks, 2016; Shu & Meagher, 2017; Thijs et al., 2019).

For net female labour participation it is expected that if a person is religious, he/she will work fewer hours (Besamusca et al., 2015; Camussi, 2013; Huberman & Minns, 2007; Khoudja & Fleischmann, 2014). The reasoning behind this is that the three main Western religions all push the need to conform to the traditional division of paid and domestic work between the genders (man works, woman takes care of the household). The scientific literature argues that this reduces both the willingness of women to work at all (gross labour participation), and also reduces the number of hours they make if they do work (Khoudja & Fleischmann, 2014; Besamusca et al., 2015; Camussi, 2013; Huberman & Minns, 2007).

Age

The third control variable for both gender role attitudes and net female labour participation is age. This factor has been identified by a number of studies as having a small, but significant impact on the outcomes for both of the dependent variables. For gender role attitudes it is expected that an older person will have more traditional gender role attitudes as compared to a young person (Knight & Brinton, 2017; Siordia, 2016; Walter, 2018; Boehnke, 2011).

The reasoning behind this relationship is that the older an individual is, the higher the chance that he/she grew up within a generational context in which traditional attitudes towards gender roles were the norm. Whereas this chance gets lower the younger a person is (Meagher & Shu, 2019; Shorrocks, 2016; Shu & Meagher, 2017).

For net female labour participation the relationship between it and age is a bit more complicated. Research shows that overall, the older a woman becomes the fewer working hours she will make. However, the exact relationship between these two variables depends strongly on the study's choice as to how to categorise what it means to be old or young. For example Besamusca et al. (2015) find that women younger than 20 and older than 60 differ most from women in between these two age categories in their level of net labour participation. With the former working significantly more, and the latter working significantly less. This trend also holds up pretty well if the two groups are extended by including women younger than 25, or older than 55.

Overall though, it is expected that as a woman's age increases she will work fewer hours. The reasoning behind this being that as a woman gets older will start to convert her initial (young) drive of wanting to create a career and stable future for herself into other more leisure orientated preferences. For example related to wanting to spend more time with her (grand)children or concerns about her physical and mental well being at a later age. This effect is expected to be large (Herault & Kalb, 2020; Huberman & Minns, 2007; Khoudja & Fleischmann, 2014; Vlasblom & Schippers, 2004; Attanasio et al., 2008; Eckstein & Lifshitz, 2011).

Cultural background

The fourth control variable, only relevant for gender role attitudes, is cultural background. This factor has been identified by a number of studies as being of strong importance in determining outcomes for especially public gender role attitudes. It is expected that if a person has a non-Western background, his/her attitudes toward gender roles will be more traditional (Siordia, 2016; Pepin & Cotter, 2017; Scarborough et al., 2018; Shu & Meagher, 2017). The reasoning behind this is that people with a non-Western background have not been exposed (as much) to Western ideas about the need for freedom for an individual to create his/her own identity and have his/her own kind of reasoning. Ideas which are largely related to the Age of Enlightenment. The effect is expected to be large (Scarborough et al., 2018; Shu & Meagher, 2017; Siordia, 2016; Pepin & Cotter, 2017).

Employment status

The fifth control variable, only relevant for gender role attitudes, is employment status. This factor has been identified by a large number of studies as having a small but significant effect on the outcomes for gender role attitudes. The concept of employment status is split into two parts. Namely, whether or not an individual has a job, and how many hours the individual works in that job.

It is expected that both having a job, and working more hours, makes an individual's gender role attitudes more egalitarian (André et al., 2013; Walter, 2018; Boehnke, 2011; Hu & Scott, 2014). The reasoning behind this is that people who work tend to experience the benefits related to labour participation more closely. Which in turn makes them develop a more positive opinion towards the idea that both sexes should be allowed to participate (Pepin & Cotter, 2017; Scarborough et al., 2018; Shorrocks, 2016; Shu & Meagher, 2017).

Family composition

The sixth control variable, relevant for both gender role attitudes and net female labour participation, is family composition. This factor has been identified by a very large number of studies as being of relative importance in determining outcomes for both of the dependent variables. For gender role attitudes the concept of family composition focuses around the question whether or not an individual has a child or not. It is expected that having a child (versus not having a child) makes an individual's gender role attitudes slightly more egalitarian (André et al., 2013; Knight & Brinton, 2017; Siordia, 2016; Walter, 2018; Boehnke, 2011).

The reasoning behind this is that an individual who has a child to take care of tends to experience the benefit of more egalitarian (equal) approaches to things like division of household tasks more closely. Which in turn makes them more inclined to support egalitarian approaches to gender roles (Hu & Scott, 2014; Pepin & Cotter, 2017; Scarborough et al., 2018; Shorrocks, 2016; Shu & Meagher, 2017).

For net female labour participation the concept of family composition focuses on the number of children a woman has. Also referred to as fertility in the scientific literature. It is expected that as the number of children a woman has increases, she will work fewer hours (Aaronson et al., 2020; Altuzarra et al., 2019; Besamusca et al., 2015; Boeri & Ours, 2013; Costa, 2000; Eckstein & Lifshitz, 2011; Herault & Kalb, 2020; Kalíšková, 2018). The reasoning behind this is that more children require more time to care off, which in terms requires a mother to spend less time working. This effect is expected to be large (Khoudja & Fleischmann, 2014; Klasen et al., 2021; Pena-Boquete, 2015; Richardson et al., 2018; Shittu & Abdullah, 2019; Vlasblom & Schippers, 2004; Filler & Jennings, 2015).

Marital status

The seventh control variable for both gender role attitudes and net female labour participation is marital status. This factor has been identified by a small number of studies as being of relative importance in determining the outcomes for both of the dependent variables. For gender role attitudes it is expected that if a person is married his/her gender role attitudes will be more traditional (Knight & Brinton, 2017; Scarborough et al., 2018; Siordia, 2016; Walter, 2018). The reasoning behind this is that the family unit an individual is a part of shapes his/her ideas about things like sexuality, reproduction and also gender. Often married people

tend to have more of a traditional view on these subjects, thereby promoting more traditional gender role attitudes (Knight & Brinton, 2017; Scarborough et al., 2018; Siordia, 2016; Walter, 2018).

For net female labour participation, it is expected that being married will reduce the amount of hours a woman works (Cipollone & D'ippoliti, 2011; Costa, 2000; Eckstein & Lifshitz, 2011). The reasoning behind this is that, just like with gender role attitudes, people who are married tend to have a more traditional attitude towards things like labour participation. So women who are married for example tend to be more in favour of the traditional division of household labour (man works, woman stays at home). Resulting in a negative relationship between marital status and net female labour participation. This effect is expected to be large (Herault & Kalb, 2020; Kalíšková, 2018).

Gender role attitudes

The final control variable only relevant for net female labour participation is an interesting one. It being gender role attitudes. The other dependent variable of this thesis has been identified as being of significant importance in determining the outcomes for net female labour participation. It is expected that a woman with more egalitarian gender roles in terms of her public and private spheres will work more hours (Fagan, 2014; Fernández, 2013; Camussi, 2013; Cipollone & D'ippoliti, 201; Costa, 2000). The reasoning behind this is that a woman with more egalitarian beliefs about, for example, the appropriateness of women working full-time will of course also carry these beliefs into her own decision-making as to how many hours she wants to work. This effect is expected to be large (Eckstein & Lifshitz, 2011; Huberman & Minns, 2007; Khoudja & Fleischmann, 2014; Luke, 2019).

Chapter 3: research design

Having discussed the theory, it is now time to look at the research design. First, the background of the data and the method of data collection data will be examined. Second, the methods used for data analysis are discussed. Third, the limitations of the research are presented. Lastly, all the theoretical concepts presented in chapter 2 will be operationalised.

Data collection and background

This thesis uses data from the LISS Core Study. This panel is part of the MESS project, under the supervision of the research institute CentERdata (CentERdata, w.d.). In 2006 this institute Received funding from the Ministry of Education, Culture and Science to build on their new MESS project. This project created, amongst other things, the longitudinal LISS panel with which researchers could study Dutch society.

The LISS Core Study consists of an annual survey, conducted for the first time in 2007, which is filled in by a representative sample of the Dutch population. Consisting of 4500 households with around 7000 individual respondents. The survey contains questions about a large number of topics. Including financial subjects like income and debt, but also social topics like family composition, ethnicity and social integration (CentERdata, w.d.).

The decision to collect quantitative, survey data from the LISS in order to study the relationship between labour tax credit, gender role attitudes and net female labour participation, boils down to two main reasons. First, the capstone within which this thesis was written had the explicit requirement of needing to use micro-data for the analysis of human behaviour and public policy. That being data collected at the level of a single individual. Second, all research looking at gender role attitudes requires the use of survey data in order to capture an individual's ideas about the appropriate roles for men and women.

For the research data was collected from the LISS for the time frame 2012 - 2015. The additional two years (2012 & 2015) were included in the data to be able to study the more long term effects of the 2013-2014 tax reform. The author had the intention to include 2011 and 2016 in the sample too, but data for these years was incomplete. The sample which was created contained about 35.000 observations.

Data analysis

Four methods of data analysis were used. The first and the second being more general methods, mainly used to test the validity and reliability of the data. Starting with examining the descriptive statistics of the variables used. By looking at the descriptive information of all the operationalised variables (see operationalisation variables), and comparing this to other data on the Dutch population from the Central Bureau for Statistics (CBS), one can gauge whether or not the sample is a good representation of the Dutch population.

Second, a correlation table was created to check for one of the most common pitfalls in statistical analysis, the problem of multicollinearity. Defined as the phenomenon in which two (or more) variables in a multivariable regression model are highly correlated (Angrist & Pischke, 2015). Meaning that they are measuring the same thing, and are therefore influencing each other's outcomes. Multicollinearity is known to distort the results of regression analysis unless it is spotted and dealt with beforehand. As a rule of thumb, if two variables are shown to have a correlation higher than 0,8 one of them should be removed from the model (Angrist & Pischke, 2015; Woolridge, 2010).

The third method of data analysis is the first of the two kinds of regression analysis which are used for the research. Namely, an ordinary least squares or OLS regression. Within the field of statistics an OLS regression is seen as (one of) the most basic forms of regression analysis (Angrist & Pischke, 2015; Woolridge, 2010). This means that in the context of many studies, including this one, it isn't the best kind of analysis to use. In the case of this research for example, because it focuses on a shift in variables between two points in time (2013 - 2014) one needs to use a kind of regression analysis which allows researchers to account for time effects. An OLS regression can however serve as a baseline, with which the results of other, better fitting, regression analyses can be compared (Angrist & Pischke, 2009).

The second, and main kind of regression analysis used, is a so-called difference in differences (DiD) regression. This is a kind of regression analysis which, in absence of truly random assignment, tries to replicate an (natural) experimental research design. It does this by studying the divergence of a post-treatment path for a so-called treatment group, as compared to that set by a comparison or control group (Angrist & Pischke, 2015). A DiD regression is well suited for studying the possible effect of a reform taking place at a specific point in time, which does influence a certain group of people (treatment group), but does not influence

another group of people (control group). This fits well with the 2014 Dutch tax reform in which a specific group of citizens was given a significant raise in terms of labour tax credit, whilst another group did not receive this raise.

As DiD forms the main kind of regression analysis used to study the relationship between labour tax credit, gender role attitudes and net female labour participation, it is important to briefly discuss the three main assumptions the method is built on. In addition to an examination of the control and treatment groups which were created in order to be able to run the DiD regression. As mentioned in chapter 1, the 2014 Dutch tax reform significantly increased the amount of labour tax credit citizens with an income from labour higher than €12.000/year. With this group receiving up to €374 more in tax credits. The control group making less than €12.000/year from labour didn't see their amount of labour tax credit increase significantly (Tax and Customs Administration, 2017).

The author had two important characteristics in mind when creating the so-called treatment and control groups. First, the control group should only contain people who's amount of labour tax credit didn't change significantly. Everybody else should be placed in the treatment group. Second, the amount of people in both groups should be similar.

Both of these characteristics were achieved by creating a control group containing individuals making less than €12.000/year from labour, and a treatment group containing individuals making more than €12.000/year, but also less than €27.500/year. The reason for this, which might come across as a rather random cut-off point, is to make sure that both groups contained a similar amount of individuals. Namely, around 1500.

Moving on to the three assumptions related to DiD. These are 1) common time effects, 2) exogeneity of the reform, and 3) no expectation effects (Angrist & Pischke, 2015). The first assumption states that in the absence of a reform, both the treatment and control groups will develop in a similar way. In the context of the thesis this means that in the absence of the 2014 tax reform, the gender role attitudes and net female labour participation of the treatment and control group should develop in similar ways during the 2012 - 2015 time frame. This assumption was tested, and no evidence was found for different developments in terms of gender role attitudes or net female labour participation between the control and treatment groups.

The second assumption states that the reform should not be related to other developments in the control and treatment groups. In the context of the thesis this means that the change in labour tax credit should not be related to any developments in the control and treatment groups. This assumption was tested, and a little bit of evidence was found for a problem with exogeneity. This limitation will be discussed in more detail in the following section.

The third assumption states that individuals within the dataset should not be expecting the reform. Meaning that the treatment group should react to the reform before it has actually taken place. In the context of the thesis this means that the people in the treatment group should not show signs of significant changes in their gender role attitudes or net female labour participation between the announcement of the tax reform in late 2012, and the actual reform at the beginning of 2014. This assumption was tested, and no evidence was found.

Limitations

Based on a review of the validity and reliability of the research, three points of limitations have been identified. First, as was mentioned in the previous section, there might be a problem with the second assumption of the DiD regression on the exogeneity of the 2014 tax reform. As was brought up by the author's supervisor, the fact that the amount of labour tax credit is calculated based on an individual's income from labour allows the individual a bit of room to select himself/herself for either the treatment or the control group. But how?

Income from labour depends on two things: wage and amount of working hours. For example, if an individual decides to work more hours, his/her income from labour will go up. Possible pushing it over the border of €12.000/year. Another way through which this can happen is if the individual gets a raise, changes jobs (different wage and hours), decides to work less, or quits work entirely. Either way, an individual can influence his/her chances of being selected for the control or treatment group by changing his/her behaviour. Which is a problem. Because this means that the second DiD assumption about the reform not being related to other developments in the control and treatment groups might not be true.

The author has tried to counter this limitation by checking the number of people in the treatment and control groups across the 2012 - 2015 time frame. To see if evidence for a significant amount of movement between the two groups can be found. This is not the case. However, this does not mean that the limitation is not relevant. Since a lack of chance in the

sizes of the two groups might just be the result of a similar amount of people moving between the two groups. Despite the checks, this limitation remains a factor that could have negatively impacted the reliability and validity of the empirical findings.

The second and third limitations of the research are significantly less severe as the previous, though that doesn't mean they should be ignored. First, a common point which is made in the scientific literature on gender roles attitudes is the existence of a validity problem with the excessive use of survey data in this field. Because answering survey questions depends on the interpretation of the reader, questions might be answered differently than intended.

For example, a reader might interpret a question about his/her attitude towards having a female manager as asking him/her about how much he/she would obey assignments from this manager. Whilst the researcher might have intended the question to be about whether or not the respondent would feel okay about having a female manager.

A possible counter to this limitation was mentioned during the conceptualisation of gender role attitudes in chapter 2. Namely that one's conceptualisation should be based on multiple points of data. Relating this to survey data, that implies that one should try to base their concept of public and private gender role attitudes on several questions. Not just one or two. As will be mentioned in the following section, the author has operationalised the concept of public and private gender role attitudes based on four questions per kind of attitudes.

A final limitation of the research is the fact that due to a problem with incomplete data, the author's initial goal of studying the long-term effects of the 2014 tax reform in the time frame between 2011 - 2016 could not be accomplished. Furthermore, based on a review of the scientific literature, the amount of child care benefits (kinderopvangtoeslag) was expected to have a significant effect on both gender role attitudes and net female labour participation. Unfortunately, due to low response rates to questions about child care benefits not enough data could be gathered in order to add the variable into the regression analysis. But, it is argued that the use of 7 other control variables will be enough to counter this possible, slight drop in validity and/or reliability of the results.

Operationalisation of variables

With these limitations in the back of one's mind, it is now time to operationalise the variables. This will be based on the conceptualisation of the variables as presented in chapter 2. The list of all the concepts includes the following: 1) net female labour participation, 2) public gender role attitudes, 3) private gender role attitudes, 4) labour tax credit, 5) education, 6) religion, 7) age, 8) cultural background, 9) employment status, 10) family composition and 11) marital status.

Starting with net female labour participation, this concept is operationalised using a survey question which asks respondents how many hours they work a week. For public gender role attitudes a custom scale with a minimum value of 4, and a maximum value of 20 was created by adding the answers to four questions about a respondent's attitude to public gender roles together. For all of the four questions the respondent was asked to rate on a scale from 1 - 5 how much he/she agreed or disagreed with the given statement.

These included: 1) overall, family life suffers the consequences if the mother has a full-time job, 2) both the father and mother should contribute to the family income, 3) the father should earn money, while the mother takes care of the household and the family, and 4) it is unnatural for women in firms to have control over men. The scale was framed so that an increase in its value meant that an individual's gender role attitudes became less egalitarian.

The concept of private gender role attitudes was conceptualised in a similar way. Although it was operationalised by adding together the scores of three of the four questions and subtracting the final one. This is because the framing of the last question was different compared to the other three, in that an increase in its value meant that an individual's gender role attitudes became more traditional. As opposed to the other three questions for which an increase in their value meant that an individual's attitudes became more egalitarian.

For all of the four questions a respondent was asked to rate on a scale from 1 - 5 how much he/she agreed or disagreed with the given statement. These included: 1) a working mother's relationship with her children can be just as close and warm as that of a non-working mother, 2) fathers ought to do more in terms of household work than they do at, 3) fathers ought to do more in terms of childcare than they do at present, and 4) married people are generally happier than unmarried people.

The next concept, labour tax credit, was calculated using data from the Tax and Customs Administration (2017) on the amount of labour tax credit an individual was supposed to get given his/her income from labour. For this, a survey question asking how much a respondent had earned in income from labour was used. The next concept, education, was conceptualised by creating three dummy variables looking at whether an individual had completed either a low, medium or high level of education. For this, a survey question asking respondents what level of education they had completed with a diploma, was used.

The dummy variable for low education had a value of 1 if an individual had either completed primary school, or an intermediate secondary education (vmbo). The dummy variable for medium education had a value of 1 if an individual had completed either a higher secondary education (havo/vwo), or an intermediate vocational education (mbo). The dummy variable for higher education had a value of 1 if an individual had completed either a higher vocational education (hbo), or had a university degree.

The concept of religion was conceptualised by creating a dummy variable looking at whether or not an individual was religious. For this, a survey question asking a respondent whether or not he/she considered themselves to be religious was used. Next, the concept of age was operationalised by creating two dummy variables looking at whether or not an individual was between the ages of 15 - 34 years old, or between the ages of 35 - 64 years old. So the young age dummy had a value of 1 if an individual was between 15 - 34 years old, and the old age dummy had a value of 1 if an individual was between 35 -64 years old. For this, a survey question asking a respondent about in which age category he/she belonged was used.

The concept of cultural background was operationalised by creating a dummy variable looking at whether or not an individual had a non-Western background. For this, a survey question asking a respondent about his/her social background was used. The non-Western background dummy had a value of 1 if an individual had a non-Western background. The concept of employment status was conceptualised by creating both a dummy variable looking at whether or not an individual had a job, and by using a survey question asking a respondent how many hours he/she works a week. The same variable used to determine net female labour participation.

The concept of family composition was operationalised by creating both a dummy variable looking at whether or not an individual has a kid, and by using a survey question asking a respondent how many children he/she has. The final concept, marital status was conceptualised by creating a dummy variable looking at whether or not an individual was married or not. For this, a survey question asking a respondent about their marital status (burgerlijke staat) was used.

Chapter 4: empirical findings

This chapter presents the findings of the regression analyses. First, the descriptive statistics of the dependent variables, the independent variable and control variables are given. Next the results of the multicollinearity check are discussed. After this the outcomes of the ordinary least squares (OLS) regression are presented. Finally, the results of the difference in differences regression are analysed. Based on the outcomes of the regressions, the alternative hypotheses as stated in chapter 2 will either be accepted or rejected.

Descriptive statistics

The first variable whose descriptive statistics are analysed is the dependent variable net female labour participation. Looking at table 1, the average number of hours a Dutch woman worked per week between 2012 - 2015 is approximately 24. With a corresponding standard deviation of around 14 hours. These numbers are very similar to those of the Central Bureau of Statistics (2021c), which found that women on average worked 25 hour during this time frame.

The same goes for net male labour participation, which was added as an extra variable to test whether or not the dataset represented the Dutch labour market correctly. The average number of hours a Dutch male worked was found to be around 34 hours a week, with a standard deviation of 16 hours. These numbers are slightly off when compared to those of the Central Bureau for Statistics (2021c). As they show that men on average worked 36 hours between 2012 - 2015.

Moving on to the second dependent variable, gender role attitudes. As mentioned in the previous chapter, the variables for public and private gender role attitudes were created by adding and subtracting the answer to 4 questions with a scale of 1 - 5. For public gender role attitudes the scale was shaped in the direction that as it increases it means that a respondent has more traditional attitudes. The opposite is true for private attitudes. With an average score of around 10, a standard deviation of 2, on a scale of 4 - 20, the average respondent scores slightly below the halfway mark in terms of having a traditional attitude to gender roles in his/her public sphere. With an average score of around 8, a standard deviation of 2, on a scale of -2 - 14, the average respondent scores slightly above the halfway mark in terms of having an egalitarian attitude to gender roles in his/her private sphere (see table 1).

Table 1*Descriptive statistics all variables (part 1)*

Variable	Number of observations (N)	Minimum	Maximum	Mean	Standard deviation
Net female labour participation	7830	0	140	24,14381	13,75357
Net male labour participation	7125	0	150	33,79775	16,47453
Gender role attitudes (public)	23.154	4	20	9.916472	2.175122
Gender role attitudes (private)	23.177	-2	14	8.003667	2.272043
Labour tax credit	34.925	0.01733	2220	803.3119	633.8734
Education (low)	11.269	0	1	0.302849	0.459497
Education (medium)	13.509	0	1	0.3269005	0.4690873
Education (high)	11.147	0	1	0.2943164	0.4557414

As mentioned in chapter 1, statistical data on gender role attitudes in the Netherlands is relatively scarce. Nonetheless, when compared to other data the scores of the dataset are slightly different. For example, compared to data looking at public support for the idea that women are better at taking care of children, the average respondent in the dataset tends to be a little bit more traditional in his/her way of thinking (Central Bureau for Statistics, 2020b; Thijs et al., 2019). Next is the independent variable, labour tax credit. The minimum, maximum and average values line up perfectly with tax data on the amount of labour tax credit between 2012 - 2015 (Central Bureau for Statistics, 2018).

Table 2
Descriptive statistics all variables (part 2)

Variable	Number of observations (N)	Minimum	Maximum	Mean	Standard deviation
Religious	16.692	0	1	0.2193271	0.4137966
Age (35 - 64)	11.629	0	1	0.4836364	0.4997393
Age (15 - 34)	9.487	0	1	0.2621904	0.4398319
Non-Western background	3.859	0	1	0.0434073	0.2037751
Employment status (work yes/no)	24.512	0	1	0.2970079	0.4569466
Employment status (hours worked)	11.485	0	150	29.54471	15.74365
Marital status	10.438	0	1	0.5160487	0.4997495
Has child	19.266	0	1	0.044646	-.2039034
Fertility	8.359	0	15	2.36536	1.09613

The last three variables of table 1 are the dummy variables looking at the highest level of education a respondent has completed. One can tell that they are dummy variables based on their minimum and maximum values being 0 and 1. By calculating the percentage of respondents who have completed either a low, medium or high level education, based on the number of observations for each variable and the total number of observations (34.925), one can compare these results to those of the CBS. It is calculated that around 31% of individuals in the dataset have completed a low level education, 38% a medium level education, and 31% a high level education. These numbers line up to those found by the CBS and Eurostat (2021).

The first variable of table 2 shows that around 47% of individuals in the dataset consider themselves to be religious. This matches data found by the CBS (2019a). The second two dummy variables show that about 33% of the dataset is between 35 - 64 years old, and that around 27% is between 15 - 34 years old. This also matches CBS (2021c) data.

The next dummy variable shows that around 11% of the dataset has a non-Western background. The CBS (2020a) finds similar results. Next is the dummy variable looking at the first part of employment status. Namely the amount of people that have a job. It is found that around 70% of the people in the dataset have a job. Which fits CBS (2021a) data on gross labour participation rates well.

The next variable is named differently, but is basically the exact same thing as the variable in table 1 looking at net labour participation. The only difference is that it includes both men and women. And as expected its mean and standard deviation are slightly higher than those of the variable looking at net female labour participation (Central Bureau for Statistics, 2021a). The next variable shows that around 30% of people in the dataset are married, which matches data found by the CBS (2021b). The last two variables show that around 60% of people in the dataset have (had) children, and that on average people in the dataset have 2 children. Both of which correspond with CBS (2019b) data.

Based on this review of the descriptive statistics one can conclude that the dataset seems to be an accurate representation of Dutch society between 2012 - 2015. With the exception of gender role attitudes and net male labour participation, all variables match data from the Central Bureau for Statistics.

Multicollinearity check

As mentioned in chapter 3, the author created a correlation table with all the variables used for the research in order to check for possible multicollinearity. One again, the rule of thumb states that if two variables are shown to have a correlation higher than 0,8 one of them should be removed from the model to prevent a distortion of results. It is important to remember that, in accordance with statistical literature, the correlation table was created before specific variables were combined or changed (Angrist & Pischke, 2015). So for example, all of the 8 survey questions looking at gender role attitudes have been added to the regression table separately. Instead of in their later form of public and private gender role attitudes. Due to the large size the table itself won't be added to the thesis, but its results are discussed.

The correlation table shows 4 cases of two variables having a correlation with a value higher than 0,5. The highest correlation has value of 0,7655 and is between two survey questions asking how much a respondent agrees/disagrees with the following statements: fathers ought

to do more in terms of household work than they do at present, and fathers ought to do more in terms of childcare than they do at present. Looking at the two variables, it isn't hard to understand why the correlation between the two is relatively high. Since it is logical to assume that if a respondent believes that a man should do more household work, they would also believe that a man should do more in terms of taking care of children. Since the correlation between the two variables doesn't break the 0,8 barrier, and because of the high importance of both variables in determining private gender role attitudes, they remained.

The other three cases had respective correlation values of -0,6766; -0,5887 and 0,6326. The first of these three was between the variable looking at marital status and the second of the two survey questions mentioned above. Namely the one looking at the statement that a father should do more household work. The second was between the variable looking at whether or not a respondent has (had) children and the same statement question about household work. The last was between the variable looking at whether or not a respondent has (had) children and the one looking at marital status. Since neither of these three cases break the 0,8 barrier they were kept in the dataset.

OLS regression: labour tax credit and gender role attitudes

Table 3 gives results of 4 OLS regressions. The first regression looks at the effect of labour tax credit on public gender role attitudes without control variables (model 1). The second regression looks at the effect of labour tax credit on private gender role attitudes without control variables (model 2). The third regression looks at the effect of labour tax credit on public gender role attitudes with control variables (model 3). The last regression looks at the effect of labour tax credit on private gender role attitudes with control variables (model 4).

In model 1 the independent variable has a coefficient with a value of -0,0001. The relationship is negative, so the tax reform resulted in a drop of 0,0001 in public gender role attitudes. Meaning that one becomes more egalitarian. The variable is very significant with a p-value < 0,001. Model 1 has an R-squared (R^2) of 0,0013. Which means that the model explains 0,13% of the change in the dependent variable. In model 2 the independent variable has a coefficient with a value of 0,00007. The relationship is positive, so the tax reform resulted in a rise of 0,00007 in private gender role attitudes. Meaning that one becomes more egalitarian. The variable is relatively significant with a p-value < 0,01 (see table 3).

Table 3*Ordinary least squares regression effect labour tax credit on gender role attitudes*

Variable	Model 1	Model 2	Model 3	Model 4
Labour Tax Credit	-0,0001*** (0,00002)	0,00007** (0,00002)	-0,00002 (0,00003)	0,0001*** (0,00003)
Education (low)			0,372* (0,169)	-0,031 (0,168)
Education (medium)			-0,215 (0,165)	0,238 (0,164)
Education (high)			-0,821*** (0,165)	0,544** (0,164)
Religious			0,644*** (0,047)	-0,597*** (0,052)
Age (35-64)			-0,021 (0,109)	-0,217 (0,110)
Age (15-34)			0,030* (0,118)	-0,897*** (0,119)
Non-Western background			0,893*** (0,100)	-0,177 (0,121)
Employment status (work yes/no)			-0,278*** (0,078)	0,062 (0,087)
Employment status (hours worked)			-0,001 (0,001)	-0,007*** (0,002)
Marital status			0,183*** (0,048)	-0,558*** (0,052)
Has child			-0,094 (0,093)	0,069 (0,107)
R ²	0,0013	0,0005	0,084	0,047
N	19.424	19.440	9.362	9.371

Note: * $P < 0,05$ ** $P < 0,01$ *** $P < 0,001$

Model 2 has an R-squared of 0,0005. Which means that the model explains 0,05% of the change in the dependent variable (see table 3). In model 3 the independent variable has a coefficient with a value of -0,00002. This is a slight drop compared to model 1. The relationship is negative, so the tax reform resulted in a drop of 0,00002 in public gender role attitudes. Meaning that one becomes more egalitarian. The variable has also turned insignificant. Adding the control variables increased the R-squared to 0,084. So the model explains 8,4% of the change in the dependent variable (see table 3).

In model 4 the independent variable has a coefficient with a value of 0,0001. This is a slight increase compared to model 2. The relationship is positive, so the tax reform resulted in a rise of 0,0001 in private gender role attitudes. Meaning that one becomes more egalitarian. The variable is very significant with a p-value $< 0,001$. Adding the control variables increased the R-squared to 0,047. So the model explains 4,7% of the change in the dependent variable (see table 3).

The most relevant control variables in models 3 and 4 were education (high), religion and marital status. Having relatively high effects on both public and private gender role attitudes, and being significant in both models to (at least) the second degree. So having a p-value $< 0,01$. Having a high education level seems to make somebody more egalitarian, which was the expected effect based on the scientific literature (see chapter 2). Being religious seems to make somebody less egalitarian, as was expected. Lastly, being married seems to make somebody less egalitarian, which also was the expected effect (see table 3).

OLS regression: labour tax credit and net female labour participation

Table 4 gives results of 2 OLS regressions. The first regression looks at the effect of labour tax credit on net female labour participation without control variables (model 1). The second regression looks at the effect of labour tax credit on net female labour participation with control variables (model 2). In the first model the independent variable has a coefficient with a value of -0,004. The relationship is negative, so the tax reform resulted in a woman working 0,004 fewer hours. The variable is very significant with a p-value $< 0,001$. The model has an R-squared of 0,055. Which means that the model explains 5,5% of the change in the dependent variable (see table 4).

In model 2 the independent variable has a coefficient with a value of 0,003. The relationship is positive, so the tax reform resulted in a woman working 0,003 more hours. This is a change compared to model 1, since both the direction of the variable changed from negative to positive and its value changed. Though the latter wasn't altered much. The variable is very significant with a p-value $< 0,001$. Adding the control variables tripled the R-squared to 0,142. Which means that the model explains 14,2% of the change in the dependent variable (see table 4).

The most relevant control variables in model 2 were education fertility, marital status and public gender role attitudes. Being significant to (at least) the second degree, so having a p-value $< 0,01$. Having an additional child seems to result in a woman working fewer hours, which was the expected effect based on the scientific literature (see chapter 2). Being married seems to result in a woman working less, as was expected. Lastly, having more traditional public gender role attitudes (remember that a rise on the scale of public attitudes means that somebody becomes less egalitarian/more traditional) seems to result in a woman working less. Which also was the expected effect (see table 4).

Table 4*Ordinary least squares regression effect labour tax credit on net female labour participation*

Variable	Model 1	Model 2
Labour Tax Credit	-0,004*** (0,0002)	0,003*** (0,0005)
Education (low)		-3,838 (2,842)
Education (medium)		-3,190 (2,813)
Education (high)		0,351 (2,809)
Fertility		-1,256*** (0,307)
Religious		-0,681 (0,693)
Age (35-64)		3,151 (1,625)
Age (15-34)		-1,920 (1,824)
Marital status		-2,069** (0,691)
Gender role attitudes (public)		-0,762*** (0,159)
Gender role attitudes (private)		0,272 (0,164)
R ²	0,055	0,142
N	5681	1657

Note: * $P < 0,05$ ** $P < 0,01$ *** $P < 0,001$

DiD regression: labour tax credit and gender role attitudes (13/14)

Table 5 gives results of 4 DiD regressions for the time frame 2013 - 2014. So the period one year before and after the tax reform (-1, +1). The first regression looks at the effect of labour tax credit on public gender role attitudes without control variables (model 1). The second regression looks at the effect of labour credit on private gender role attitudes without control variable (model 2). The third regression looks at the effect of labour tax credit on public gender role attitudes with control variables (model 3). The last regression looks at the effect of labour tax credit on private gender role attitudes with control variables (model 4).

In model 1 the independent variable has a coefficient with a value of -0,079. The relationship is negative, so the tax reform resulted in a drop of 0,079 in public gender role attitudes. Meaning that one becomes more egalitarian. The variable is not significant. Model 1 has an R-squared of 0,001. Which means that the model explains 0,1% of the change in the dependent variable (see table 5). In model 2 the independent variable has a coefficient with a value of -0,027. The relationship is negative, so the tax reform resulted in a drop of 0,027 in private gender role attitudes. Meaning that one becomes less egalitarian. The variable is not significant. Model 2 has an R-squared of 0,0003. Which means that the model explains 0,03% of the change in the dependent variable (see table 5).

In model 3 the independent variable has a coefficient with a value of 0,048. This is a change compared to model 1, since both the direction of the variable changed from negative to positive and its value changed. The relationship is positive, so the tax reform resulted in a rise of 0,048 in public gender role attitudes. Meaning that one becomes less egalitarian. The variable remained insignificant. Adding the control variables increased the R-squared to 0,081. So the model explains 8,1% of the change in the dependent variable. The high number of control variables also halved the number of observations (see table 5).

In model 4 the independent variable has a coefficient with a value of -0,212. This is a significant drop compared to model 2. The relationship is negative, so the tax reform resulted in a drop of 0,212 in private gender role attitudes. Meaning that one becomes less egalitarian. The variable remained insignificant. Adding the control variables increased the R-squared to 0,053. So the model explains 5,3% of the change in the dependent variable. The number of control variables also halved the number observations (see table 5).

Table 5*Difference in difference regression effect labour tax credit on gender role attitudes (13/14)*

Variable	Model 1	Model 2	Model 3	Model 4
Labour Tax Credit	-0,079 (0,174)	-0,027 (0,177)	0,048 (0,184)	-0,212 (0,190)
Education (low)			0,525* (0,244)	-0,066 (0,238)
Education (medium)			-0,078 (0,239)	0,218 (0,233)
Education (high)			-0,663** (0,239)	0,588** (0,233)
Religious			0,642*** (0,068)	-0,610*** (0,077)
Age (35-64)			-0,029 (0,166)	-0,125 (0,166)
Age (15-34)			0,268 (0,180)	-0,736*** (0,181)
Non-Western background			0,940*** (0,143)	-0,423* (0,187)
Employment status (work yes/no)			-0,184 (0,106)	0,052 (0,126)
Employment status (hours worked)			-0,001 (0,002)	-0,007** (0,002)
Marital status			0,153* (0,069)	-0,560*** (0,076)
Has child			-0,049 (0,184)	0,162 (0,228)
R ²	0,001	0,003	0,081	0,053
N	9560	9569	4452	4458

Note: * $P < 0,05$ ** $P < 0,01$ *** $P < 0,001$

The most relevant control variables in models 3 and 4 were education (high), religion and marital status. Having relatively high effects on both public and private gender role attitudes, and being significant in both models to (at least) the first degree. So having a p-value $< 0,05$. Having a high education level seems to make somebody more egalitarian, which was the expected effect based on the scientific literature (see chapter 2). Being religious seems to make somebody less egalitarian, as was expected. Lastly, being married seems to make somebody less egalitarian, which also was the expected effect (see table 5).

Furthermore, for public gender role attitudes specifically, non-Western background and education (low) were also found to be relevant. Especially the former, which was found to have a large effect with a very high level of significance. Having a p-value $< 0,001$. Having a non-Western background seems to make somebody less egalitarian, which was the expected effect. Having a low education seems to make somebody less egalitarian, which was the expected effect. The variable had a relatively large effect, albeit with a lower level of significance. Having a p-value $< 0,05$.

DiD regression: labour tax credit and net female labour participation (13/14)

Table 6 gives results of 2 DiD regressions. The first regression looks at the effect of labour tax credit on net female labour participation without control variables (model 1). The second regression looks at the effect of labour tax credit on net female labour participation with control variables (model 2). In the first model the independent variable has a coefficient with a value of 0,023. The relationship is positive, so the tax reform resulted in a woman working 0,023 more hours. The variable is insignificant. The model has an R-squared of 0,0004, so the model explains 0,04% of the change in the dependent variable (see table 6).

In model 2 the independent variable has a coefficient with a value of -1,116. The relationship is negative, so the tax reform resulted in a woman working -1,116 less hours. This is a change compared to model 1, since both the direction of the variable changed from positive to negative and its value changed. The variable remained insignificant. Adding the control variables significantly increased the R-squared to 0,107. Which means that the model explains 10,7% of the change in the dependent variable. It is relevant to mention that the number of observations for both of the models is relatively low. Especially compared to the possible number of observations, which is around 17.500 for the 2013 - 2014 time frame. Adding the control variables halved the number of observations (see table 6).

The most relevant control variables in model 2 were fertility, age (both young and old), marital status and both kinds of gender role attitudes. Being significant to (at least) the second degree, so having a p-value $< 0,01$. Having an additional child seems to result in a woman working fewer hours, which was the expected effect. Both being young and being old seem to result in a woman working more.

This is different from the expected effect, as being old was predicted to have a negative impact on net female labour participation. Being married seems to result in a woman working less, as was expected. Lastly, having more traditional public gender role attitudes seems to result in a woman working less. On the flip side of this, having more egalitarian private gender role attitudes seems to result in a woman working more. Both of which were the expected effect (see table 6).

Table 6

*Difference in difference regression effect labour tax credit on net female labour participation
(13/14)*

Variable	Model 1	Model 2
Labour Tax Credit	0,023 (1,049)	-1,116 (1,329)
Education (low)		-6,427* (3,260)
Education (medium)		-5,042 (3,227)
Education (high)		-1,009 (3,212)
Fertility		-1,389*** (0,360)
Religious		-0,919 (0,756)
Age (35-64)		5,991*** (1,704)
Age (15-34)		4,346** (1,940)
Marital status		-2,251*** (0,759)
Gender role attitudes (public)		-0,744*** (0,178)
Gender role attitudes (private)		0,420** (0,182)
R ²	0,0004	0,107
N	2852	1423

Note: * $P < 0,05$ ** $P < 0,01$ *** $P < 0,001$

DiD regression: labour tax credit and gender role attitudes (12/15)

Table 7 gives results of 4 DiD regressions for the time frame 2012 - 2015. So the period two years before and after the tax reform (-2, +2). The first regression looks at the effect of labour tax credit on public gender role attitudes without control variables (model 1). The second regression looks at the effect of labour credit on private gender role attitudes without control variable (model 2). The third regression looks at the effect of labour tax credit on public gender role attitudes with control variables (model 3). The last regression looks at the effect of labour tax credit on private gender role attitudes with control variables (model 4).

In model 1 the independent variable has a coefficient with a value of -0,034. The relationship is negative, so the tax reform resulted in a drop of 0,034 in public gender role attitudes. Meaning that one becomes more egalitarian. The variable is not significant. Model 1 has an R-squared of 0,004. Which means that the model explains 0,4% of the change in the dependent variable (see table 5). In model 2 the independent variable has a coefficient with a value of -0,165. The relationship is negative, so the tax reform resulted in a drop of 0,165 in private gender role attitudes. Meaning that one becomes less egalitarian. The variable is not significant. Model 2 has an R-squared of 0,004. Which means that the model explains 0,4% of the change in the dependent variable (see table 5).

In model 3 the independent variable has a coefficient with a value of 0,016. This is a change compared to model 1, since both the direction of the variable changed from negative to positive and its value changed. The relationship is positive, so the tax reform resulted in a rise of 0,016 in public gender role attitudes. Meaning that one becomes less egalitarian. The variable remained insignificant. Adding the control variables increased the R-squared to 0,086. So the model explains 8,6% of the change in the dependent variable. Once again, the number of observations was halved by the addition of the control variables (see table 7).

In model 4 the independent variable has a coefficient with a value of -0,225. This is a slight drop compared to model 2. The relationship is negative, so the tax reform resulted in a drop of 0,225 in private gender role attitudes. Meaning that one becomes less egalitarian. The variable has turned significant with a p-value $< 0,01$. Adding the control variables increased the R-squared to 0,051. So the model explains 5,1% of the change in the dependent variable. Here the number of observations also got halved (see table 7).

Table 7*Difference in difference regression effect labour tax credit on gender role attitudes (12/15)*

Variable	Model 1	Model 2	Model 3	Model 4
Labour Tax Credit	-0,034 (0,122)	-0,165 (0,125)	0,016 (0,128)	-0,225** (0,134)
Education (low)			0,393** (0,168)	-0,041 (0,167)
Education (medium)			-0,188 (0,165)	0,225 (0,164)
Education (high)			-0,790*** (0,165)	0,563*** (0,164)
Religious			0,638*** (0,047)	-0,596*** (0,052)
Age (35-64)			-0,057 (0,109)	-0,195 (0,109)
Age (15-34)			0,260* (0,118)	-0,892*** (0,118)
Non-Western background			0,911*** (0,099)	-0,175 (0,121)
Employment status (work yes/no)			-0,287*** (0,075)	0,063 (0,086)
Employment status (hours worked)			-0,002 (0,001)	-0,005*** (0,002)
Marital status			0,179*** (0,048)	-0,557*** (0,052)
Has child			-0,158 (0,094)	0,115 (0,107)
R ²	0,004	0,004	0,086	0,051
N	19424	19440	9362	9371

Note: * $P < 0,05$ ** $P < 0,01$ *** $P < 0,001$

The most relevant control variables in models 3 and 4 were education (high), religion and marital status. Having relatively high effects on both public and private gender role attitudes, and being significant in both models to the third degree. So having a p-value $< 0,001$. Having a high education level seems to make somebody more egalitarian, which was the expected effect based on the scientific literature (see chapter 2). Being religious seems to make somebody less egalitarian, as was expected. Lastly, being married seems to make somebody less egalitarian, which also was the expected effect (see table 7).

Furthermore, for public gender role attitudes specifically, non-Western background, education (low) and employment status (work yes/no) were also found to be relevant. Particularly the former, which was found to have a large effect with a p-value $< 0,001$. Employment status was found to have the same level of significance. Having a job seems to make somebody more egalitarian, which was the expected effect. Having a low education seems to make somebody less egalitarian, which was also the expected effect. The latter variable had a p-value $< 0,01$.

DiD regression: labour tax credit and net female labour participation (12/15)

Table 8 gives results of 2 DiD regressions. The first regression looks at the effect of labour tax credit on net female labour participation without control variables (model 1). The second regression looks at the effect of labour tax credit on net female labour participation with control variables (model 2). In the first model the independent variable has a coefficient with a value of 0,636. The relationship is positive, so the tax reform resulted in a woman working 0,636 more hours. The variable is insignificant. The model has an R-squared of 0,0004. Which means that the model explains 0,04% of the change in the dependent variable.

In model 2 the independent variable has a coefficient with a value of -1,143. The relationship is negative, so the tax reform resulted in a woman working -1,143 less hours. This is a change compared to model 1, since both the direction of the variable changed from positive to negative and its value changed. The variable remained insignificant. Adding the control variables significantly increased the R-squared to 0,11. Which means that the model explains 11% of the change in the dependent variable. The addition of two extra years to the regression increased the number of observations compared to table 6, but only really for model 1. The second model barely gained any observations (see table 8).

The most relevant control variables in model 2 were fertility, age (only old), marital status and both kinds of gender role attitudes. Being significant to (at least) the second degree, so having a p-value $< 0,01$. Having an additional child seems to result in a woman working fewer hours, which was the expected effect. Being old seems to result in a woman working more.

This is different from the expected effect, as being old was predicted to have a negative impact on net female labour participation. Being married seems to result in a woman working less, as was expected. Lastly, having more traditional public gender role attitudes seems to result in a woman working less. On the flip side of this, having more egalitarian private gender role attitudes seems to result in a woman working more. Both of which were the expected effect (see table 8).

Table 8

*Difference in difference regression effect labour tax credit on net female labour participation
(12/15)*

Variable	Model 1	Model 2
Labour Tax Credit	0,636 (0,747)	-1,143 (1,271)
Education (low)		-6,187* (2,938)
Education (medium)		-4,980 (2,910)
Education (high)		-1,014 (2,900)
Fertility		-1,320*** (0,323)
Religious		-0,719 (0,703)
Age (35-64)		4,690*** (1,664)
Age (15-34)		3,563* (1,850)
Marital status		-2,387*** (0,698)
Gender role attitudes (public)		-0,758*** (0,178)
Gender role attitudes (private)		0,428** (0,163)
R ²	0,0004	0,11
N	5681	1657

Note: * $P < 0,05$ ** $P < 0,01$ *** $P < 0,001$

Final analysis

In chapter 2 the body of existing scientific literature was used to create two alternative hypotheses about the expected effect of labour tax credit on gender role attitudes and net female labour participation. For the first of these relationships the following hypothesis was given:

H_{a1}: An increase in the amount of labour tax credit an individual earns will make the public and private gender role attitudes of the individual more egalitarian.

With the exception of the baseline OLS regression, no model showed labour tax credit having a statistically significant, egalitarian effect on public gender role attitudes. As was argued in chapter 3, regression analysis using the DiD model fits the design of the researcher better than OLS. Therefore it is argued that the results of the OLS regression should be overruled by the DiD analyses. Based on the lack of statistical proof, the alternative hypothesis for public gender role attitudes is rejected.

However, both the OLS regression as well as model 4 in table 7 did find a statistically significant effect of labour tax credit on private gender role attitudes. Although, the effect of the long-term (2012 - 2015) DiD regression found a negative relationship between labour tax credit and gender role attitudes. Meaning that the tax reform made individuals less egalitarian. Which isn't what the alternative hypothesis predicted based on previous research. Therefore, again because of a lack of corroborating proof, the alternative hypothesis for private gender role attitudes is rejected.

For the relationship between labour tax credit and net female labour participation the following alternative hypothesis was given:

H_{a1}: An increase in the amount of labour tax credit a woman earns will increase the amount of working hours she makes.

With the exception of the OLS regression, no model showed labour tax credit having a statistically significant effect on net female labour participation. Again it is argued that the results of the DiD regression overrule the OLS results. Meaning that the alternative hypothesis for the effect of labour tax credit on net female labour participation is rejected.

But what can explain the research findings opposing the theoretical predictions made in chapter 2? Is the theory incorrect, or are the findings of this thesis an exception to the rule? The author thinks that the answer to these questions lies in studying the results of the control variables. As was predicted in the theoretical framework, and supported in the empirical findings, several controlling factors had a very significant and large effect on gender role attitudes and net female labour participation. For the former these were education (high), religion and marital status. With education (low), non-Western background and employment status (work yes/no) also found to be relevant. Albeit only in determining the outcome for public gender role attitudes. For the latter these were marital status, fertility, age and both kinds of gender role attitudes.

It might be possible that the 2014 Dutch tax reform, through its increase of labour tax credit, did have an impact on gender role attitudes and/or net female labour participation, but that these effects were overshadowed by the control variables. All of whom, with the exception of age (old), had the effects that they were expected to have based on the scientific literature. A side note, it is likely that the effect of age (old) was different than expected because the group was too big. So that the relatively young people (35 - 50) were reducing the negative correlation between the later ages and net female labour participation.

The main argument behind this idea is that the author doesn't think it would be logical to conclude that all existing empirical data on the relationship between labour tax credit, gender role attitudes and net female labour participation is wrong. It seems more reasonable to think that a combination of the increase in labour tax credit not having been extremely large (significant, but not giant), and the fact that several control variables had a very significant and sizeable effect on the dependent variables, can explain the lack of support for the alternative hypotheses.

Furthermore, looking at the results for net female labour participation specifically, the number of observations for the regressions were relatively low. Especially when compared to the numbers of the gender role attitudes regressions. Which were found to be around three times as high for the models without control variables, and up to nine times as high for the model with control variables (see tables 5, 6, 7 & 8). It is possible that the relatively low number of observations is part of the reason that these regressions didn't find statistically significant results.

A final, common point which needs to be made here is related to the limitations which were mentioned in chapter 3. One should not exclude the possibility that the limitation related to the assumption of exogeneity for the DiD regression is (part of) the reason that no significant effects could be found. The other two limitations, related to the use of survey questions and limited capabilities of the research to check for long term effects passed the 2012-2015 time frame, could also have had an impact here.

Chapter 5: conclusion

The goal of this thesis was to study the effects of the 2014 Dutch reform, which increased the level of labour tax credit, on gender role attitudes and net female labour participation using data from the LISS Core Study. By specifically looking at net labour participation, including social and cultural factors in the analyses, using multiple survey questions for the concept of gender role attitudes, and focusing the research on a specific country, the author hoped to add knowledge to the academic field of Public Administration. And to help future policy-makers with deciding how to best stimulate female labour participation to counter the effects of an ageing population. The research question of the thesis was as follows:

What is the effect of the 2014 Dutch tax reform on gender role attitudes and net female labour participation?

Using the existing body of scientific literature the dependent, independent and control variables were conceptualised. For gender role attitudes this meant splitting it into a public and private variant. Based on the presented theory two alternative hypotheses for the relationships between labour tax credit, gender role attitudes and net female labour participation were presented. In addition, a large number of control variables were identified as important determinants of the dependent variables.

Having discussed the theoretical building block of the thesis, attention was turned to its research design. After the background of the data and method of data collection had been examined, the relevant methods of data analysis were presented. With a particular emphasis on the use of a DiD design, whose three main statistical assumptions were analysed. A possible, significant limitation of the research in terms of exogeneity was identified here. Possible checks and consequences of this, and two other limitations, were discussed.

Lastly the actual empirical analysis was conducted. However, with the exception of the OLS regressions and 1 model in the final DiD regression on net female labour participation, no statistically significant evidence was found in favour of the alternative hypotheses. Based on which, both were rejected. Three possible reasons for this lack of evidence were presented. Those being a possible overshadowing by the control variables, a relatively low number of observations for net female labour participation, and interference caused by the limitations.

Based on this, the answer to the research question as to what the effect of the 2014 Dutch tax reform was on gender role attitudes and net female labour participation is nothing. Again, it might be possible that the policy change did have an impact, but that this was drowned out by the three factors mentioned above. However, the empirical results speak for themselves. And based on these results the author is left with no other logical option, then to conclude that the tax reform had no effect on either gender role attitudes or net female labour participation.

Suggestions for future research are twofold. First, the author argues in favour of further research into the 2014 tax reform, or others like it in the Netherlands. Particular emphasis should be placed on trying to deal with the exogeneity limitation. Perhaps by doing additional checks on possible movement between control and treatment groups, or another (kind) of tax reform should be analysed. One which gives less to no room for possible self-selection.

Second, other authors should try to replicate the research design of this thesis and use it to study similar tax reforms in other countries in Europe and/or North-America. Particular emphasis should be placed on replicating the use of the public-private split concept of gender role attitudes, as well as the addition of the cultural and social control variables. Since these were found to be of significant importance in determining both dependent variables.

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