SCHOOL OF ECONOMICS AND MANAGEMENT

Lund University

Niklas Grabowski

To Value Household Work

A Study on the Size of Household Production and its Effects on the National Accounts

NEKH01

Bachelors Thesis, Department of Economics

15 Higher Education Credits

Supervisor: Klas Fregert

Semester of Graduation: Spring 2016

Words: 14824

Contents

Abstract

The national accounts, and specifically GDP, are often taken as a measure of welfare and increased wellbeing in society. However, in reality these measures are not created for measuring welfare, and even in measuring productions there are often significant problems.

Furthermore, problems arise when we try to compare national accounts between countries, or between different periods. During the decade I looked at, labour force participation increased with close to 6 points in total for Germany, while the corresponding number for Sweden was 1 point.

This thesis aims to look at exclusion of household production from the national accounts. My purpose was to look at how large household production is in relation to GDP and NNI, and how growth during 2000-2010 in Sweden, and 2002-2012 in Germany, change when we add imputed numbers for household production.

The results I find are, that for my most conservative estimate household production made up around 20 % of GDP for Germany, while for my largest estimates it made up around 49-60 % of German GDP, and around 40 % of Swedish GDP with NNI numbers on average being 10 % higher. In my conclusions, I state that it is possible, given the data present, that part of Germany's increase in GDP and NNI can be explained by an increase in participation rate of the labour force, and constitutes a partial transfer of production from the household into the market, rather than being an increase in production. While at the same time, there are far fewer indications this is the case for Sweden. This due to that labour participation has remained largely unchanged, and while time spent on household production has decreased, it has done so far less than in Germany. However, any results must be interpreted with care, as estimates differ largely based on imputation method chosen.

Keywords: GDP, National income, Household production, National accounts, Imputation

Sammanfattning

Nationalräkenskaperna, och särskilt BNP, används idag ofta som ett mått på välfärd och välmående i samhället. Dock, i verkligheten är dessa mått inte ämnade att mäta välfärd och även när det gäller att mäta produktion finns det oftast stora problem.

Utöver detta uppträder det ofta problem när man ska jämföra nationalräkenskaperna mellan länder eller olika tidsperioder. Under den tidsperiod jag använde mig av, ökade deltagandet i arbetsmarknaden med nästan 6 procentenheter för Tyskland, medan motsvarande siffra för Sverige var kring 1 procentenhet.

Detta arbete syftar att undersöka hushållsproduktionen från nationalräkenskaperna. Mitt syfte var att undersöka hur stor hushållsproduktionen är i relation till BNP och NI, och hur tillväxten mellan 2000-2010 för Sverige och 2002-2012 för Tyskland påverkas när vi lägger till dessa värden.

Resultaten jag fann var att för min mest konservativa uppskattning motsvarade hushållsproduktion ungefär 20 % av Tysklands BNP, medan mina största uppskattningar landade kring 49-60 % av Tysklands BNP och kring 40 % för Sveriges BNP, medan NI i snitt var cirka 10 % högre. I min slutsats nämner jag, att givet datan jag har använt mig av, att en del av Tysklands tillväxt i BNP och NI möjligtvis kan förklaras genom det ökade arbetsmarknadsdeltagandet och att det åtminstone kan röra sig om en partiell transferirng från hushållsproduktion, snarare än en ren ökning av produktionen. Samtidigt fanns det färre indikationer att så var fallet för Sverige. Detta eftersom arbetsmarknadsdeltagandet var relativt konstant, trots att det ökade marginellt, och även om arbetstiden i hushållen minskade, så var det en mycket mindre minskning än den motsvarande minskning i Tyskland under samma period. Trots detta, måste all tolkning av resultaten göras försiktigt, eftersom uppskattningar starkt varierar beroende på vilken metod man använder sig av för att värdera hushållens produktion.

Nyckelord: BNP, Nationalinkomst, Hushållsproduktion, Nationalräkenskaperna, Imputering

Abbreviations

GDP	Gross domestic product
NNI	Net national income
OECD	Organization for Economic Cooperation and Development
SNA	The Systems of National Accounts
GS	General Substitute
OC	Opportunity cost
MV	Market value
SCB	Statistiska Centralbyrån

1 Introduction

1.1 Background

Gross domestic product is widely used in society by both policy makers and researchers. However, that also means that as a metric we need to be critical towards what it includes and what it excludes. The national accounts of today exclude household production and fail to accurately measure welfare. While some would argue that GDP and NNI are not meant to measure welfare, they are after all utilised this way. Thus, it becomes ever more important to fully understand what increases our welfare, and what does not. This study is an attempt at estimating the size of one of those flaws, and showing how it affects the national accounts.

1.2 Problems in the Status Quo

When GDP and other national accounts are used as a measure of welfare and as the basis for policy decisions, it is of outmost importance that we can trust the numbers we use, and that they are comparable. If this is not the case, when policy decisions are based on faulty or misleading numbers, severe consequences can follow. Nowhere is this clearer than with the focus on GDP, which neglects the damage to the environment.

Yet the environment is not the only issue when it comes to the national accounts. When measuring what is to be included in the national accounts and GDP, the limits are set by the production boundary. Household work is likely the largest exclusion from the national accounts, which is problematic as GDP then does not fully reflect the production in society. This initial problem is compounded due to that regardless of the size of the error it makes, any comparison is far more difficult if there is a change in the relative size of that error. That is to say, the underlying structure of the economy changes. Such changes are extremely difficult to take into account when we compare GDP results, either in time or between countries. While statistical offices try to take technological progress into account, which can drastically change the structure of our economy, they have generally not accounted for the change in how households work and what they produce. When the nature of what, or how much households produce changes, it affects the rest of the economy, yet it is largely unaccounted for.

Finally, if taken at face value, any increase in GDP is currently seen as beneficial, however, in reality an increase in GDP due to marketization of household production will not lead to an increase in welfare in of itself. Hence, a thorough understanding of what GDP and the national accounts include and do not include is needed, and recognizing the size of the household sector and understanding how it affects the national accounts, is part of the greater understanding needed.

1.3 Purpose

The purpose of this thesis is to look into how the household sector can impact the national accounts, both in absolute numbers as well as growth. It aims to at least give a partial explanation of what is included in the notion of GDP and NNI, as well as what is not, and why that is.

By expanding the production boundary of GDP, and indirectly NNI as it is based on GDP, and therefore including household production, I aim to calculate an approximate value of household production as a percentage of GDP and NNI, and illustrate how this can influence both the size and the perceived growth of the national accounts.

1.4 Research Question

I have two research questions:

- How large is the household sector of Germany and Sweden in relation to GDP and NNI if one accounts for the household work done by individuals between the ages of 20-64?
- How does the growth in GDP and NNI in Sweden during 2000-2010, and Germany during 2002-2012, change when these values are added?

1.5 Delimitations

I have chosen to focus specifically on the value of unpaid housework and if counted, what percentage of the GDP and NNI it would constitute. The reason for choosing these two metrics is first the prevalence of GDP in economic and political debate, and secondly, the fact that NNI is the closest metric to look at welfare that is currently widely used in national

accounting. The reason for choosing to limit myself only to look at unpaid household work is due to in part the massive omissions that exist when looking at GDP, and in part due to there already being a wealth of research into the value of the environment and its impact on society. Though the environment and unpaid work both undeniably constitute a large part of the value created in society, I have chosen to focus on the issue with less research.

Furthermore, I have chosen to limit myself to household work when it comes to unpaid labour. Household work constitutes the largest sector of unpaid work, and is the one that has the strongest impact on society as a whole. Other forms of unpaid labour, such as volunteer programs, NGO's, or charities are an important part of society, but are comparatively small when it comes to output compared to the collected household work done in society. Finally, I have limited myself to people between the ages of 20-64, due to limitations in the data available. It is undeniable that people above the age of sixty-four spend a significant time on household production, and so this is regrettable. However, while not part of the study, the general results would hold true for any age group not included and their contribution should not go unnoticed.

1.6 Research Frontier

Criticism concerning the national accounts is nothing new, and in recent memory the report by Stiglitz, Sen, & Fitoussi (2009) has gained particular attention. However, this is far from the first time the national accounts have been criticized for what they include, or what they are used. While the afore mentioned report is the most recent and comprehensive, already in the 1980s a critique arose against the exclusion of household production amongst other things by authors such as Waring (1989), built on by Wood (1997), and Berneria (2003). My own work builds upon on the foundations laid by Chadeau (1992) and Bergman (2003).

1.7 Method, Theory, and Material

My method is to compare the time spent on household work in Germany and Sweden, and to see how changes in household labour or labour participation affect the national accounts. For this I will impute a value on the time spent on household work. I will use the time surveys created by each countries statistical office as a foundation for this, to gauge how much time is spent doing household work. I will then look at how large household production is in relation to the size of GDP and NNI for both Sweden and Germany, and see if the addition of the

household sector changes the growth of either nation between 2000-2010 and 2002-2012 respectively.

My imputation values are based on the average salary level for a citizen of respective country and the average salary for a custodian of each respective country.

My theory consists largely of previous research in the field of national accounting, as well as research done on the use of time surveys. To be able to accomplish all of this I will be using data published and collected and by Statiska Centralbyrån, Statistsisches Bundesamt, and the OECD. In particular I am using the time use surveys from Sweden in 2000 and 2010, and the time use surveys in Germany from 2002 and 2012 as major foundations for my research.

1.8 Disposition

My disposition consists of first going through the national accounts and its history, while then moving on to household work, what it consists of and how it is defined in the time use surveys. I then go through the data I am using, explaining my rationale and what I have chosen, and why. This is followed by my calculations where I show my work, as well as the variables used and explain how to replicate the results. The last chapter is designated results, analysis and conclusion where I discuss the results I got, analyse why I got the outcome that I did, and analysis what conclusions we can draw from this and my recommendations on where to now, and on the use of this study.

2 Measuring Income and its Relation to Welfare

2.1 History of the National Accounts

The history of national accounting can trace its origins back to 1665. Kendrick (1970) divides the history of national accounting into two separate parts, with the first lasting until about the end of World War I. The major driving factor for the first national income account was to be able to judge the taxation base of England, and to compare its material strength to its rivals (Kendrick, 1970). From the very start, the national accounts were based on calculating the flow, rather than the stock, of production (Kendrick, 1970; Waring, 1989). Similarly, from the very beginning, a double-entry approach was adopted, counting income on one side and expenses on the other (Kendrick, 1970; Studenski, 1961).

The initial focus was on all forms of production and rents, including imputed values for unaccounted household production (Kendrick, 1970). After the attempts by Sir William Petty researched continued and Smith, Marx, and Marshall made further additions during the first phase of the development of national accounting. By the end of World War I, a largely universalized system had been created (Kendrick, 1970; Studenski, 1961). After World War I, the development was largely towards further focus on monetary transactions, specifically on all forms of investment, and rents from assets tangible or not (Kendrick, 1970). The modern definition of national accounting has, by and large, been influenced by Pigou when he argued in his seminal work *welfare* that to measure welfare, one should focus on that which ‘’can be brought directly or indirectly into relation with the measuring rod of money’’, showing that already in 1920 welfare was associated with GDP (Pigou, 1920). Its modern dominance, however, springs from 1939 when the League of Nations for the first time in its annual *World Economic Survey* presented national accounts as a metric but complained of the difficulty in comparing it amongst nations. In the meantime, Simon Kuznets in the United States had made important progress, and Richard Stone in the United Kingdom respectively, which were to have huge influence on further developments and negotiations (Kendrick, 1970). In 1944 representatives for various Allied countries met in Washington to discuss the concept, method, and various ways of presenting the national income accounts universally

(Kendrick, 1970; Studenski, 1961). This led to the report *Measurement of National-Income and the construction of social accounts* in 1947 by the League of Nations committee of statistical exports, and finally in 1953 the United nation implemented what is today known as the *Standard System of National accounts* (SNA). The SNA aimed towards standardizing all national accounts to make them comparable between countries (Kendrick, 1970; Studenski, 1961; Waring, 1989). It was hugely successful and the total number of countries with national accounts grew from 39 to 93 by 1955 and to 130 by 1969 (Kendrick, 1970). The SNA consolidated the view that national accounting was a double-entry system, focused on market transactions, capital rents, and measured the flow of the economy and not its stock (Kendrick, 1970; Studenski, 1961; Waring, 1989).

2.2 Relation to Welfare and Criticisms

2.2.1 Limits to the Numeric approach

> When international reports and writers refer to women as statistically or economically invisible, it is the UNSNA that has made them so. When it dawns on you that militarism and the destruction of the environment are recorded as growth, it is the UNSNA that has made it so. When you are seeking out the most vicious tools of colonization, those that can obliterate a culture and a nation, a tribe or a people's value system, then rank the UNSNA among those tools. When you yearn for a breath of nature's fresh air or a glass of radioactive-free water, remember that the UNSNA says that both are worthless. (Waring, 1989, p. 49)

Over the years GDP, and the national accounts as a whole, have gathered a significant amount of criticism from both academics and the wider public. In general the critique can be summarised into two main points, critique against how the national accounts are calculated, and critique against how the national accounts are used (Stiglitz, Sen, & Fitoussi, 2009; Economist, 2016). I will briefly summarize three major critiques brought forward. First on the use of GDP and what Stiglitz, Sen, & Fitoussi (2009) call the classical issues, second on the feminist critique of GDP, third on the environmentalist critique on GDP

Already in 1934 there were voices warning against the use of GDP as a measure for welfare, and concerns were raised again before the creation of the SNA (Waring, 1989; Coyle, 2014). Regardless of this, the SNA moved ahead and a high GDP and GDP growth are today synonymous with welfare (Stiglitz, Sen, & Fitoussi, 2009; Economist, 2016; Coyle, 2014). Several key issues in the measuring of GDP have been identified as particularly problematic

(Coyle, 2014; Stiglitz, Sen, & Fitoussi, 2009). When it comes to the classical issues, the first issue raised was that quality improvements are extremely problematic to measure and skew the statistics, the second issue was valuation of goods not sold on the market, such as education and healthcare, the third major issue was on intermediate and defensive expenditure (Stiglitz, Sen, & Fitoussi, 2009) and a fourth issue is the inclusion of services (Coyle, 2014). Stiglitz, Sen, & Fitoussi (2009) argue for that the problem with the first issue is that quality improvements in an era of ever-quicker expanding technology are playing a more important role in our welfare, yet contribute the same amount to our GDP as a much earlier iteration of the same product years before, which contributed far less to our wellbeing. GDP fails consistently in considering innovation, and often undervalues the contribution of innovation and product improvement (Coyle, 2014).

On the second issue, Stiglitz, Sen, & Fitoussi (2009) argue that goods not sold on open markets, below market price, or not sold at all contribute too little to GDP for it to be a reliable tool in correctly gauging what society produces. When two institutions can produce the identical product, but due to different regulation or organisational structure contribute differently to GDP it again clouds the usefulness of GDP as a measure of our productivity.

On the third issue, Stiglitz, Sen, & Fitoussi argue that GDP and its production boundary need to be redefined, especially in regards to what counts as intermediate spending (Stiglitz, Sen, & Fitoussi, 2009). The example of broken windows and a booming window-maker is well known and Stiglitz, Sen, & Fitoussi argue that defensive expenditures should be excluded from GDP, just as intermediary goods are, in order for it to be a proper measure of production and productivity in society.

The fourth of what Stiglitz, Sen, & Fitoussi (2009) call the classical issues with GDP, is the inclusion and valuation of services which often lacks proper data, and has been a problem since the beginning (Landefeld, Seskin, & Fraumeni, 2008). While measuring expenditure for the private sector helps in the valuation of services, it is more troublesome in the public sector (Coyle, 2014; Stiglitz, Sen, & Fitoussi, 2009). Part of the problem is a significant lack of data (Landefeld, Seskin, & Fraumeni, 2008), but also how to properly evaluate and impute a reasonable estimate to the data that does exist (Stiglitz, Sen, & Fitoussi, 2009; Economist, 2016).

The feminist critique is centred on a discussion in regards to the production boundary. As Pigou (1920) already argued in *Welfare*, output was to be measured by its monetary value,

thereby forcing an exclusion of anything without such a value (Waring, 1989). This is argued to skew GDP data significantly (Stiglitz, Sen, & Fitoussi, 2009; Waring, 1989; Chadeau, 1992; Bergman, 2003; Beneria, 2003). Furthermore, it is argued that it excludes the value and productivity of women in society due to the often rather strict separation between unpaid household work and paid non-household work that has developed from this view (Blau, Ferber, & Winkler, 1998; Waring, 1989; Beneria, 2003). Much of the responsibility for this is put on the SNA by Waring (1989).

When the first SNA manual came out in 1953 and the decision was made to exclude certain categories, including all household labour and sustenance farming. It eventually lead to the abandonment of any alternative way of calculating GDP (Kendrick, 1970; Waring, 1989). Alternatives have existed, originally a value for household work was imputed by Sir William Petty in 1665 (Kendrick, 1970), and Norway used to include household work until the adoption of the SNA (Waring, 1989). Recent attempts of doing the same have shown that household work and labour continue to make up a large part of production, and contribute significantly to society (Bergman, 2003; Chadeau, 1992).

The environmental critique is largely centred on the issue of whether we actually are better off when we increase production at the cost of the environment or the future (Stiglitz, Sen, & Fitoussi, 2009; Coyle, 2014). The argument goes that while production based on the depletion of natural resources does increase our short-term gain, it says very little on the actual long-term increase in the welfare, and thus undermines the ability of GDP as a tool for judging welfare, and the growth of it (Stiglitz, Sen, & Fitoussi, 2009; Coyle, 2014). However, the problem is known, and steps are being taken to try to adjust to the problem, such as Stiglitz, Sen, & Fitoussi (2009), and the SNA 2008 (Coyle, 2014). Furthermore, measures already exist which do try to consider resource depletion, but they are not yet widely used or as accepted (Coyle, 2014).

2.2.2 Advantages of a Numeric Approach

Despite the criticism above, GDP is not without its merits. The national accounts were created as a way to compare the output of different nations (Kendrick, 1970). The standardization of the national accounts after World War II was in direct response of the challenges governments faced when confronted with total war and required an ever-deeper understanding of the economy (Kendrick, 1970; Studenski, 1961). In fact, GDP has,

according to Coyle (2014) been hailed by some as one of the greatest economic inventions of the 20th century and was mentioned in both the reasoning behind the Nobel Prize for Simon Kuznets, and Richard Stone respectively (Waring, 1989). GDP is seen as a relatively simplistic yet useful tool (Coyle, 2014). Historically it has allowed nations to base decisions on more data than before its invention (Kendrick, 1970). As widely evident by its large adoption worldwide, GDP has had a huge influence on economic policy post-world war II, and in many ways, it has been considered a useful, and successful, invention (Coyle, 2014; Kendrick, 1970).

Furthermore, it is often argued in defence of GDP as a metric, that it is not the metric itself that is at fault, but rather how it is used (Stiglitz, Sen, & Fitoussi, 2009; Coyle, 2014). As already stated above, Kuznets himself argued against GDP being used too broadly and as a general measure for welfare (Waring, 1989). Several of the criticisms above have had valid responses presented. The environmental critique applies to GDP, but there are other metrics that take both capital depreciation and natural depreciation into account, and hence more of a question about using the right metrics, rather than changing GDP (Stiglitz, Sen, & Fitoussi, 2009; Coyle, 2014).

When it comes to what the production boundary includes Jones & Vollrath (2013) argue that a lot of the criticism applied to the structural flaws of GDP and its measuring become less relevant as long as the structure of the economy remains unchanged, as the relative measurement errors will be the same, and growth in GDP will continue to be accurate. However, criticism has been aimed towards this as well, arguing that GDP is metric for a manufacturing economy, failing to adapt to the changing nature of the modern economy with services and product improvements and that the very nature of our economy has indeed changed (Stiglitz, Sen, & Fitoussi, 2009; Coyle, 2014).

2.3 To Measure Income

2.3.1 An Overview

The easiest way to start calculating the national accounts is usually to calculate a value for GDP, and then from GDP to NNI. There are three ways of calculating GDP in society – the production approach, the income approach, and the expenditure (Landefeld, Seskin, & Fraumeni, 2008). From any one of these, one can then get to NNI (Burda & Wyplosz, 2009). Two concepts need to be developed further. When the SNA (2009) defines GDP as the value

of all final goods, it refers to the exclusion of what is called intermediary good. That is to say, that any good used in the production of another good should not count towards GDP. The idea behind it is to avoid double counting the same product (Burda & Wyplosz, 2009). Hence the final price of a good will include the price of any and all intermediary goods and only the final good will be counted, as to accurately show the production increase in society. A related concept to the idea of intermediary goods is the idea of defensive spending. Tobin and Nordhaus (1972) defined defensive spending as '' evidently not directly sources of utility themselves but are regrettably necessary inputs to activities that may yield utility''. Stiglitz, Sen, & Fitoussi (2009) give us the example of a car commute to work, while the commute itself gives no benefit, it is required for the individual to get to work.

The last concept that needs to be clarified from Mankiw's definition is the idea of which goods and services, and produced by whom at what time, fall under the definition of GDP. Mankiw (1998) gives the example of a man hired by a woman to mow the lawn, and contributing to GDP, but the very same second that same man is married to the woman buying the service, it no longer counts as part of GDP, even though the same individual produces the same service.

The concept of what falls within the definition of GDP is called production boundary (Stiglitz, Sen, & Fitoussi, 2009; Waring, 1989). While every national account has had to make a decision on what will be counted and what not, this was done on a national level until the first SNA was published in 1953, which standardized GDP and thus also what was to be included within the production boundary (Waring, 1989; Kendrick, 1970). In the original SNA (1953) the production boundary was defined and separated between production by a household and by an enterprise. It stated the following:

> In industrialized economies, in which monetary exchange and the division of labour have progressed far, the separation of households from enterprises and the inclusion in total product of production for home consumption do not constitute important practical problems in national accounting because by far the greater part of production takes place for sale in the market by enterprises (SNA, 1953, p. 5)

It goes on to state that primary producers who consume part of their produce for the household should be counted and fall within the production boundary; however, no mention is made of unpaid household work (Waring, 1989). In the latest SNA (2009), the production

boundary is again mentioned; this time household work is mentioned explicitly. It reaffirms the view that primary production, or any good made intended to be sold or bartered, ought to fall within the production boundary, however, household services should not (SNA, 2009). The reason given is as follows:

> The inclusion of large non-monetary flows of this kind in the accounts together with monetary flows can obscure what is happening on markets and reduce the analytic usefulness of the data. […] If the production boundary were extended to include the production of personal and domestic services by members of households for their own final consumption, all persons engaged in such activities would become self-employed, making unemployment virtually impossible by definition. This illustrates the need to confine the production boundary in the SNA and other related statistical systems to market activities or fairly close substitutes for market activities. (SNA, 2009, p. 6)

2.3.2 To Calculate GDP

The idea behind the income and expenditure approach is based on the idea of the flow of the circular economy, and the double-entry approach (Mankiw, 1998; Kendrick, 1970). The circular flow of the economy states that one entity's expenditure is another entity's income, that is to say, whatever a firm or a household spends, goes as revenue to a factor of production (Burda & Wyplosz, 2009). Thus the principle of double-entry in national accounting implies that GDP calculated either via the expenditure or the income approach ought to be identical, although in reality it rarely is but numbers deviate only marginally (Burda & Wyplosz, 2009). To get to the final numbers, intermediary goods are deducted from both accounts, that is only final goods and services are counted, however, defensive expenditures are not deducted. (Mankiw, 1998). The idea behind the production approach is different but related. As we avoid intermediary spending to ensure we do not double-count the same production twice, so is the idea with the production approach. The idea behind the production approach, also called value added, is to sum up the profits of every individual company along the supply chain of a specific product (Burda & Wyplosz, 2009). The idea being, just as intermediary goods are not counted for the income and expenditure approach, the price of a good minus the cost of producing that good in each stage should add up to the income and the expenditure approach (SNA, 2009)

2.3.3 From GDP to NNI

To get from GDP to NNI two things need to be done, either order is acceptable. The first is that we need to account for capital depreciation. The second is that we add the net income from abroad. What this does, is it changes our metric from production focused to income focused, and it changes it from a gross value, to a net value (SNA, 2009). Due to NNI taking into account income rather than production, as well as capital depreciation, it is often seen as more closely related to welfare of an individual than GDP (SNA, 2009).

2.4 Putting a Value on Non-Market Production

2.4.1 Imputation

Imputation is the statistical concept of imputing values to missing data. Coyle (2014) argues that there are two primary reason for the use of imputation in national accounting, the first reason is the lack of data, and the second is the time constraint. Stiglitz, Sen, & Fitoussi (2009) argue that the main reasons for the use of imputations in national accounting are first and foremost, to capture non-market activity, and secondly, to adhere to the invariance principle, which is to say that the same good ought to contribute as much to GDP regardless of the institutional framework in which it was produced.

Due to GDP trying to measure most things in society, a statistician either needs data on everything, or a way of valuing goods and services to which there is no data. Imputations cover most sectors of society but do vary in size depending on country, in all cases imputations make up a large part of GDP in society (Stiglitz, Sen, & Fitoussi, 2009). As mentioned before, imputations are not new, and were already part of the original national accounting in 1665, when the production of households were counted (Kendrick, 1970).

Stiglitz, Sen, & Fitoussi (2009) argue that there is a trade-off between comprehensibility and comprehensiveness when it comes to the use of imputation. If leisure time, household work, and more are added in, GDP would more than double and Stiglitz, Sen, & Fitoussi (2009) argue that while this does provide a more accurate view of society, it comes at the cost of the GDP numbers being largely skewed by imputed numbers. Criticism has been aimed at which parts of society we do choose to impute and which to exclude, in particular it is argued that the exclusion of household services is particularly problematic, as these do constitute

production but are excluded due to the definition of the production boundary (Silbaugh, 1996; Waring, 1989).

2.4.2 Third-Person Principle in Relation to Household Work

The most widely accepted approach in broadening the productivity border and for which activities and tasks a value should be imputed, is based on Margaret Reid's work *Economics of Household Production* (Beneria, 2003). It states that what is produced in the household but could be procured by paying a third party, should be included (Beneria, 2003; Waring, 1989). Chadeau (1992) uses roughly the same principle as advocated by Hill (1979). What both have in common is that they exclude activities such as eating, sleeping, and dressing as being non-productive, but include meal preparation, shopping, and cleaning (Beneria, 2003; Hill, 1979).

However, the third-person criterion has also been criticized, as it still excludes activities, which contribute to society and can be delegated (Wood, 1997). Wood (1997) mentions activities such as birthing, and emotional caregiving, which, it is argued, should be included by the third-party as there are individuals which can be paid to do the same, therapists, surrogates for example. Beneria (2003) responds by arguing that while the above is true to an extent, the third party criterion when including household work is a marked improvement on the status quo.

2.4.3 Chadeu's Approach

Chadeau (1992) uses what she calls the input approach to estimate a value of household work. The input approach is based on the idea of putting a monetary value on each hour worked, and then multiplying this with the hours worked at home during a year, and summarize this for all individuals in society. Chadeau (1992) presents three different input approaches, the global substitute, the specialist substitute method, and the opportunity cost of time method. The general housekeeper method is based on a general housekeeper chosen as a substitute for all household work, and being paid the market rate for a housekeeper times the hours worked during a year. The specialist method is based on each subcategory of household work being valued at the hourly wage of a worker doing said specialisation. The opportunity cost method is based on the alternative cost for the individual doing the household work, thus

all household work is valued at the wage rate of the individual concerned. Chadeau (1992) identifies several drawbacks with each method.

- Valuing time spent on housework by market wage rate implies that productivity in the household is the same as on the market: there is no evidence to support (or reject) this assumption;
- It is improbable that all housework tasks could be performed by an unqualified housekeeper, as implied in the global substitute method: some activities do require specific skills, and are not carried out equally in all households (health care or educational services, for instance);
- It is unlikely that households would in fact hire the variety of personnel which the specialist substitute method requires in principle;
- The ‘’opportunity cost of time’’ method assumes that individuals are able to work on the labour market for as many hours as they wish in jobs suiting their professional qualifications. In fact, the alternative they are often faced with either working full-time or being unemployed. Moreover, the potential wage rates of those involuntarily unemployed are often zero, or at best, minimum wage rates. This implies that the value of an hour of housework is lowest for those who perform most of it
- Wage differentials between men and women on the labour market are transferred to work in the home, without any consideration of actual expertise in performing housework
- The ‘’opportunity cost’’ method means that work resulting in the production of one good or service in the home is estimated at the value of work producing a quite different good or service on the market. Wage rates are consequently no longer related to the kind of output for which the work is performed and identical products are given different values according to who produces them. (Chadeau, 1992, p. 93)

2.4.4 Bergman’s Approach

Bergman (2003) uses a slightly different approach, again an input approach based on a time use survey is used, but Bergman bases her calculation on the cost of getting the corresponding service from the market. As a basis, she uses the price lists of two major Swedish household service providers. Bergman then takes the time spent per week on household work and the time spent per week on caring for one’s own children, imputes the cost of acquiring these services on the market, calculates a weekly cost, times fifty-two, and gets the yearly contribution per individual. The per-individual result is then multiplied with the amount of individuals in the age group 20-64 (Bergman, 2003). Bergman (2003) reflects on two issues with her approach. The first is that her approach is based on acquiring these services from the market, while the market demand for services at this price point is far lower. However, she responds by mentioning that other activities that are consumed beyond the point of consumer demand at market rates are counted towards GDP, such as education and library services. The second issue is with the age group concerned, resulting in a result skewed towards the lower end, due to especially pensioners being excluded (Bergman, 2003).

3 Householdwork

3.1 Definition of Household Work and What Counts as Work

The first issue at hand is to identify what is household work, and what parts of household labour count as productive work, and as part of GDP. Silbaugh (1996) puts this into context by giving us the case of *State V. Bachmann*, where under state laws in Minnesota a convict could apply for a work-release program during weekdays. The requirements were that the employment position came attached with a fair, and reasonable, wage. Suzanne Margie Bachmann negotiated a deal with her husband for an hourly wage to perform household duties, but was denied by a trial court. The reason for denial was stated that the employment position did not qualify. Due to homemaking not being considered employment, as well as the contract lacking consideration due to a perceived prior legal obligation for Bachmann to perform household work to her family, thus any monetary exchange was considered to be for show only (Silbaugh, 1996).

Waring (1989) argues that it can be seen in other statistical surveys as well as in employment statistics, as household work does not count as employment, individuals working in the household are either not considered to be part of the labour force, or not considered to be employed full-time.

However, despite the above a case has been made for how to evaluate household work and whether it is productive or not, by using the third party criteria (Beneria, 2003; Waring, 1989). As described above, the third party criteria can be used to differentiate between productive work and leisure time, thus allowing a distinction to be made. The third party criteria avoids having to make any judgements on whether work is enjoyable, or what ones duty is, but rather focuses on what can be considered productive by focusing on delegable.

3.2 Categories of Household Work

3.2.1 Overview

Both the German and Swedish Time Use survey make use of *The European harmonization of time use surveys* (Eurostat, 2009). Hence, the definition of household work that will be used for counting what time to value will be based on the definition used in both surveys, which due to the harmonization efforts coincides. However, while the same activity is included under the same main category, there is a slight distinction in the sub-categories. This will not affect the results, as in total, the same activities are counted for both countries.

3.2.2 Sweden

The Swedish time use survey uses the recommendations set by Eurostat, and uses five main categories, with sub-categories under each (SCB, 2012). The main category of concern for this thesis is household work, consisting of seven second-order subcategories. They are: household labour, maintenance, childcare of own children, care of others, purchase of goods and services, other household work, travel due to household work. The categories have been selected according to the third-party criteria (SCB, 2012). Furthermore, the categories have not changed since the previous time use survey, thus allowing us to make comparisons (SCB, 2003).

3.2.3 Germany

The German time use survey, just as the Swedish, sticks with the same definitions between the two different time use surveys concerning household work. However, the German time use survey has more detailed categories, and uses nine primary categories for activities. Out of interest for this thesis is the fourth category *Haushaltsführung und Betreung der Familie* as well as its subcategories. The organisation of the categories has not changed between the two time surveys (Destatis, 2015; Destatis 2004). While no explicit mention is made of the third party criteria, it is mentioned that the time use survey is following the European guidelines, and the categories are largely identical to the Swedish classification, which were based on the third party criteria (Destatis, 2014). The specific second level sub-categories under *Haushaltsführung und Betreung der Familie* are meal preparation, cleaning of the

house/apartment, the fabrication or maintenance of textiles, gardening and pet care, construction and physical maintenance and repairs, shopping, care of children in the household, the support and care of elderly in the household, other activities in the household (Destatis, 2015). While the classification between the Swedish survey and the German survey differs slightly on the second level, in total the same categories are present and included under *Hemarbete* and *Haushaltsführung und Betreung der Familie* (Destatis, 2004; Destatis, 2014; Destatis, 2015; SCB, 2003; SCB, 2012).

4 Data

4.1 Introduction

The data I have used is primarily based on data provided by Statistiska Centralbyrån, Statistiches Bundesamt, World Bank, or the OECD. It consists of the national accounts, information about salaries, annual hours worked, and labour participation. The only data I have used outside of this is the data needed to replicate Bergman's method. All links to the data are available under references and should be freely available online to the public.

4.2 Time Use Survey

4.2.1 Introduction to Time Use Survey

Both the Swedish and German time use surveys are based on the guidelines set forth by Eurostat. In the 90's a concerted effort was made to standardize the data collection in time use surveys to make them more comparable between different nations. The first report appeared in 2000, with the second report appearing in 2009 (Eurostat, 2009). The Harmonization of European time use surveys creates guidelines for the major categories that should be included, as well as how the surveys are to be carried out. It sets forth that time should be counted in a diary, provided by the statistical bureau of the nation, as well as the guidelines set out in the annex of the report. Furthermore, the guidelines recommend that the time slots should be divided up into 10 minute slots, where both the primary activity, and if applicable, any secondary activity is recorded. The guidelines strongly recommend that a random sample is used for the collection of time use. Finally, that data is collected for at least 365 consecutive days, with each individual keeping diary for two randomly selected days, to get a representative view of activities year-round.

4.2.2 Swedish Time Use Survey

The Swedish time use survey follows the guidelines set forth by Eurostat in regards to time intervals, number of days, and diary lay-out. Both surveys were conducted using the same random sampling technique, as well as undertaken in the same way (SCB, 2003; SCB, 2012).

Furthermore, both the 2010 and 2000 Swedish Time Use Survey use the same categories for activities regarding household work. The activities that are included which are of relevance for this thesis are:

- Household work, which includes
    - Meal preparation
    - Cleaning
    - Washing, ironing
    - Dish washing and setting/cleaning the table
- Maintenance work
- Care for own children
- Care for others
- Purchase of goods and services
- Other household work
- Travel due to household work.

For the 2000/2001 time use survey, the survey time was between October 2000 and one year forward. 6218 individuals were selected to keep diary, out of which 3428 responded, to count as responding at least one diary day had to be kept. The age span for the survey was 20-84 (SCB, 2003).

For the 2010/2010 time use survey, the survey time was between the 1st of April 2010 until the 31st of march 2011. 7366 individuals were randomly selected to take part in the survey, between the ages of 15-84. 2998 individuals answered the survey, with the criteria being the same as for the previous survey (SCB, 2012).

4.2.3 German Time Use Survey

The German time use survey, just as the Swedish, follows the guidelines set forth by Eurostat in regards to time intervals, number of days, and diary lay-out. Both surveys were conducted using the same random sampling technique, as well as undertaken in the same way, (Destatis, 2014). No change was undertaken in the classification of household work between the two surveys. The categories used, which are of interest for this thesis, are:

- Preparation of meals and household work in the kitchen area
- cleaning of the house/apartment,
- the fabrication or maintenance of textiles,

- gardening and pet care,
- construction and physical maintenance and repairs,
- shopping, care of children in the household,
- the support and care of elderly in the household,
- other activities in the household

The German time use survey 2012/2013 was considerably larger than the Swedish survey, consisting of 11371 responding individuals, with a total of 33842 diary days recorder, recorded between August 2012 and July 2013 (Destatis, 2014).

4.3 National Accounts

In regards to national accounts, two metrics are of interest. I have used official statistics from SCB and Destatis, in current prices, detailing GDP and NNI. I chose to use data at current price as it removed the step of having to convert everything into constant prices, which would have become problematic with my price imputations. Rather, using current prices allowed me to keep the relative numbers without any further conversions. I chose to use GDP as it is the most widely used and discussed metric in national accounting. On the other hand, NNI was chosen as it ought to relate more closely to the actual welfare of an individual, and given the close relation of household work to welfare and consumption, it might provide a more accurate depiction of the actual contribution of household work to welfare.

Table 1.

Consolidated Table of National Accounts for Sweden		
	GDP in SEK, unadjusted (current prices)	NNI in SEK, unadjusted (current prices)
2010	3,519,994,000,000	2,960,965,000,000
2000	2,380,358,000,000	1,778,677,000,000

(SCB, 2002; SCB, 2013)

Table 2.

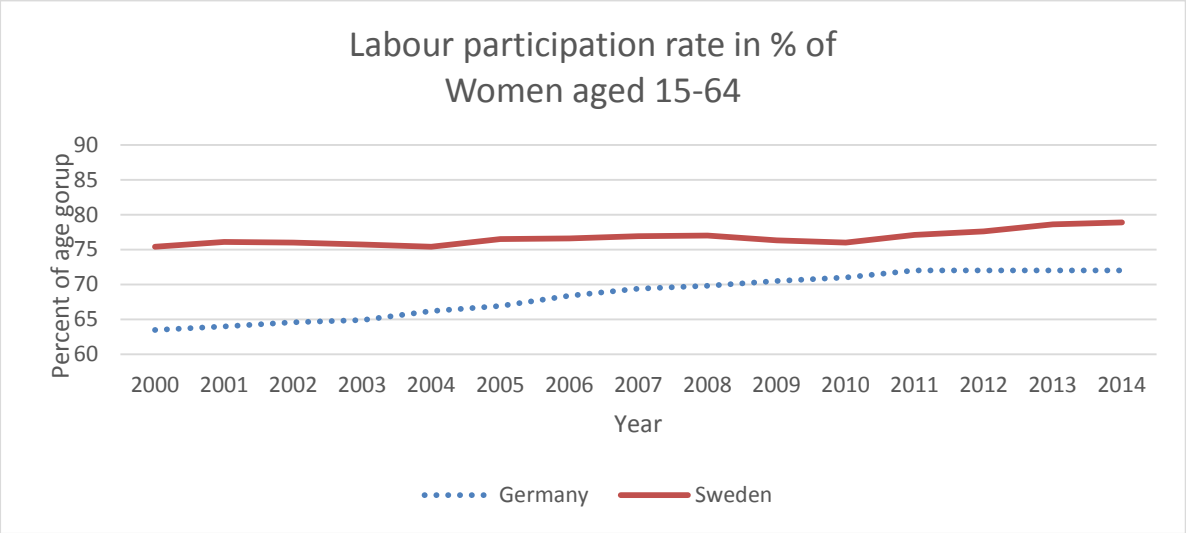
Consolidated Table of National Accounts for Germany		
	GDP in euros, unadjusted (current prices)	NNI in euros, unadjusted (current prices)
2012	2,754,860,000,000	2,292,787,000,000
2002	2,209,290,000,000	1,780,261,000,000

(Destatis, 2016 B)

4.4 Workforce Participation

The workforce participation data was gathered from the World Bank website. I choose to include data on workforce participation due to the differences between the German labour market and the Swedish labour market in regards to labour participation. While labour participation has increased in both countries over the selected period in Germany there has been a relatively strong increase in female labour participation. While data between the ages 20-64 would have been preferable, the data provided by world Bank was either 15+ or 15-64, where I decided 15-64 was preferable as it closer corresponded to the age in the time use survey.

Graph 1.



(Worldbank, 2016)

4.5 Demographics

Population data was collected from the respective countries official statistics office. For Sweden, population statistics during 2000-2010 were used, for the ages 20-64, separated by Gender. For Germany, population statistics during 2002-2012 were used, for the ages 20-64, separated by gender.

Table 3.

Consolidated Population Statistics for Sweden and Germany, Age 20 to 64							
Sweden	Men	Women	Total	Germany	Men	Women	Total

2010	2,788,580	2,706,180	5,494,760	2012	24,672,481	24,415,102	49,087,583
2000	2,645,067	2,567,460	5,212,527	2002	25,836,908	25,171,937	51,008,845

(Destatis, 2016 A; SCB, 2016 A)

4.6 Imputational Values

4.6.1 Introduction

To be able to calculate a value for household work an imputation value is required. I have three different approaches to creating such a value. I have chosen to calculate my imputation values primarily based on secondary data from SCB, Destatis, and OECD. While the numbers are not tailor-made, they do provide an overview by creating an average which, given the broad scope, should do well in estimating the value of the household work in relation to GDP and NNI.

4.6.2 General Substitute Method

The general substitute method is based on the input idea of valuing household work, that is the time spent on household work is valued based on hiring a general household keeper, who's hourly salary will be the imputation value. For Sweden, I have chosen to use the hourly salary of a custodian. The reason being, that while true that household work consists of far more than cleaning, specific salary data for general housekeeping is unavailable, and if one is to look at the nature of the work, and general salary levels, a custodian seems to be the closest match. This due to that the general substitute method is based on the idea of a non-specialized substitute, doing most day-to-day tasks as any home individual without qualification could do. To be able to get an hourly wage, I took the 2010, and 2000 average monthly salary for custodial work (SCB, 2001; SCB, 2016 C) and multiplied this by twelve to get the annual salary. After this I divided with the average annual hours worked in Sweden (OECD, 2016 A). While this method has its flaws, it does provide me a general overview of society as a whole, and a conservative estimate to use as a baseline.

To provide a general substitute valuation on household work for Germany, I again used the earnings data on custodial work. The data is based on the comprehensive earnings structure survey 2006 and 2010 (Destatis, 2009; Destatis, 2013). The data is available in euro per hour, meaning no further conversions were necessary. However, due to the time surveys being

based on 2002 and 2012, and the earnings on 2006 and 2010, there will a slight downwards bias on the imputation for 2012, and a slight upwards bias for the 2002 imputations. I have chosen not to attempt any correction, due to the dangers of influencing the data too much. Despite this, given the values concerned and the closeness of the values concerned and at least the perceived lack of a salary development for custodial work, these issues should be minor at most.

4.6.3 Opportunity Cost Method

The opportunity cost method is based on the idea that rather than doing household work, an individual could instead choose to do paid work and provide market services instead. Thus, what ought to be imputed is the alternative cost of doing household work.

To be able to get a representative opportunity cost for Sweden, I started with average monthly salary multiplied by twelve, and divided this by the average annual hours worked, giving me an estimate of the average opportunity cost that an individual faces (OECD, 2016 A; SCB, 2016 B).

To be able to create an imputation based on the opportunity cost method, I again chose to use the average annual wage, and divided this by the annual hours worked by a German worker (OECD, 2016 B). This shares the same flaws as my estimate for Sweden above, namely that it is an estimate of an average only. Despite this, it should provide a rough estimate of the hypothetical alternative cost faced by an individual.

In contrast to the general substitution method, the average annual salary for the nation as a whole is used here, instead of the monthly salary of a custodian. This is to mimic the average opportunity cost for an individual in society rather than the average salary for a custodian.

4.6.4 Market Valuation Method

When Bergman (2003) valued Swedish household work, she also used an input based approach; however, her estimates were based on the price of purchasing household goods on the market. Hence I will henceforth call it the market valuation method (MV). To be able to replicate Bergman's results, I have chosen to use the same corporation as my basis for my market price. Hemfrid (2016) is a leading provider of household services on the Swedish market, and will serve as a strong link to Bergman's earlier research. The data used is based on the pricelist provided by Hemfrid for a weekly cleaning, as well as Bergman's (2003)

article. It needs to be noted, however, that this comparison is in part complicated by the fact that Swedish taxation has changed in regards to household services since 2003. This has the effect that the price, after tax rebate, that the individual pays for the services is currently lower than it was in 2003, however, I have chosen to use the price before the tax rebate to more accurately depict a price-increase representing inflation.

Furthermore, I have been unable to find a pricelist for 2010, which would reflect the price at that time. This leads to two different problems, the first being that it is possible that the price of the goods are lower than what they would have been without state intervention, and the second being that most likely the price is higher now in 2016 than it was in 2010. However, given that tax incentives had already changed by 2010, and that the two effects should at least partially cancel each other out, I have chosen to use the data for 2016. But due to the above, comparisons between Bergman (2003) and my attempt at replicating her approach must be made with care. I have chosen to only replicate Bergman's approach for Sweden, and not for Germany. This is in part because Bergman's approach is based on market demand, rather than the wage valuation done in the previous two methods, as well as there being a lack of a nation-wide provider of household service at the same level in Germany, as exists on the Swedish market.

5 Calculations

5.1 Introduction

Before any calculations can be done, some clarifications are to be made in regards to two issues. The first is the method I have chosen to use in calculating an annual value. The general formula for my calculations is:

$$(V \cdot T_M \cdot D \cdot P_M) + (V \cdot T_W \cdot D \cdot P_W)$$

Where V stands for value per hour and represents the imputed value, T stands for hours per day spent working with household work, D stands for days, and P stands for population size. The script denotes gender, men or women[1].

However, for this to be possible two adjustments need to be made, as well as one clarification. When it comes to the time span used, contrary to Bergman (2003), I have chosen to use the amount of days, rather than calculating the amount of time per week multiplied by the number of weeks per year. The reason for this is it gives me the most accurate description of an average day, and it is the closest measure for an accurate depiction of a year, contrary to just using weeks, as it allows for 365 rather than 364 days. Furthermore, I considered what to do with leap years; in the Swedish survey from 2000, it started in October meaning leap year was not a factor. In the German Survey from 2012 it started in August and as such no changes had to be made.

The last two issues at hand is the form in which time survey presents data. The data is presented in the format Hours:Minutes per day. However, this is not the same as decimal form; for example, 2:30 is not equal to 2.3 but rather 2.5. To resolve this issue I used the recommended method by SCB (2016 D) which uses the following formula in excel to transform hours:minutes into decimal form:

[1] It must also be noted, that I have chosen to use the same imputation for men and women, and the valuation only depends on the method used. This to represent that the work done is equal, while an argument can be made for that especially in the opportunity cost method, value for an hour worked ought to be gender separated, the aim of my study is to estimate household production in relation to GDP hence the same product should be valued equally.

=TRUNC(Target Cell)+100/60(Target Cell -TRUNC(Target Cell))*

This was done to both the German and the Swedish data. However, the last issue at hand was creating an average for all days for the ages 20-64 by gender, while the Swedish data provided this, the German data did not. The German data is split into the age groups 18-29, 30-44, and 45-64. I created an average for the age group 20-64 for all weekdays by taking the total population, split up into male and female, and weighting each of the three age groups with the percentage that their age group made up of the total population of their gender in the range 20-64. While this excludes German individuals aged 18 and 19, I feel the difference will be small, as the time spent on studying, and household work should be fairly similar, and that the age groups left out only make up a tiny part of the total population covered. After this, I summed up all three weighted values into one consolidated value, and got a single value for time spent on household work on average for Men, Women, and in total. I did this for both the data from 2002, and from 2012.

5.2 General Substitute Method

5.2.1 General Population

To measure the value of household work according to the general substitute (GS) method, I use the formula presented above. I take the imputed value for the GS method, multiply the time spent on household work by women, and multiply the time spent on household work by men. I multiply each sum with 365, and then take the sum of that, the yearly contribution of each individual by gender, times the corresponding population pool. I finally add these numbers together to get the contribution of household work to GDP by households in current prices. My final step is to divide the GS value for the general population, with GDP and NNI values. For Sweden I use 2010 and 2000, and for Germany 2012 and 2002, giving me a value representing how large household production is in comparison with GDP and NNI.

Table 4.

Table of Values General Substitute Method					
Sweden	2010	2000	Germany	2012	2002
Value per hour in SEK:	144.7	106.4	Value per hour in €:	10.5	10.1
Household work per day in hours by Men, in decimal form:	3.03	2.87	Household work per day in hours by Men, in decimal form:	2.33	2.52
Household work per day in hours by	3.84	4.13	Household work per day in hours by Women, in	3.92	4.44

Women, in decimal form:			decimal form:		
Days:	365	365	Days:	365	365
Men:	2,788,580	2,645,067	Men:	24,672,481	25,836,908
Women:	2,706,180	2,567,460	Women:	24,415,102	25,171,937

Table 5.

General Substitute Method, Sweden			
Year	Contribution by the general population in SEK	Percentage of GDP	Percentage of national income
2010	995,262,907,776	28%	34%
2000	706,755,338,125	30%	40%

Table 6.

General Substitute Method, Germany			
	Contribution by general population in €	Percentage of GDP	Percentage of national income
2012	588,643,947,123	21%	26%
2002	650,679,962,754	29%	37%

5.2.2 Men and Women

To measure the value of household work according to the GS method by gender, I repeat the steps from above, but I skip the step where I sum together the contribution by men and women. I then, as before, divide the contribution in current prices by the GDP and NNI for each respective year, to give me a number displaying the contribution by gender for each year and metric.

Table 7.

General Substitute Method, Sweden						
Year	Contribution by men, in SEK	contribution by women, in SEK	Percentage of GDP by men	Percentage of GDP by women	Percentage of NNI by men	Percentage of NNI by women
2010	446,744,871,536	548,518,036,240	13%	16%	15%	19%
2000	294,535,894,895	412,219,443,229	12%	17%	17%	23%

Table 8.

General Substitute Method, Germany						
Year	Contribution by men, in €	contribution by women, in €	Percentage of GDP by men	Percentage of GDP by women	Percentage of NNI by men	Percentage of NNI by women
2012	221,265,159,178	367,378,787,946	8%	13%	10%	16%
2002	239,591,310,855	411,088,651,899	11%	19%	13%	23%

5.3 Opportunity Cost Method

5.3.1 General Population

To measure the value of household work according to the opportunity cost of time method (OC), we again use the formula described above. I take the imputed value for opportunity cost, the median wage by gender, times the time spent with household work, which gives me the value per day. I then take this for both genders times the amount of days per year, and times the population size for both genders. Finally, I add both of the sums together to give me a number for the whole population between 20-64, and I divide this number by GDP and NNI to give me an estimation of how large the household sector is compared to GDP and NNI according to the OC method.

Table 9.

Table of Values Opportunity Cost Method					
Sweden	2010	2000	Germany	2012	2002
Value per hour in SEK:	207.6	149.0	Value per hour in €:	29.6	22.6
Household work per day in hours by Men, in decimal form:	3.03	2.87	Household work per day in hours by Men, in decimal form:	2.33	2.52
Household work per day in hours by Women, in decimal form:	3.84	4.13	Household work per day in hours by Women, in decimal form:	3.92	4.44
Days:	365	365	Days:	365	365
Men:	2,645,067	2,788,580	Men:	24,672,481	25,836,908
Women:	2,567,460	2,706,180	Women:	24,415,102	25,171,937

Table 10.

Opportunity Cost Method, Sweden			
Year	Contribution in total by General population, in	Percentage of GDP	Percentage of national

	SEK		income
2010	1,427,548,817,214	41%	48%
2000	989,457,473,375	42%	56%

Table 11.

Opportunity Cost Method, Germany			
Year	Contribution in total by General population, in €	Percentage of GDP	Percentage of national income
2012	1,362,538,249,288	49%	59%
2002	1,375,738,007,825	62%	77%

5.3.2 Men and Women

To measure the value of household work according to the OC method we repeat the steps from above with the same values. However, I skip adding the numbers together from the two genders. This way I gain separate estimates for the contribution of both women and men. Once I have come up with the raw contributions for men and women, I divide this by GDP and NNI to get an estimate of how large household production in comparison to GDP and NNI by gender.

Table 12.

Opportunity Cost Method, Sweden						
Year	Contribution by men, in SEK	Contribution by women, in SEK	Percentage of GDP contributed by men	Percentage of GDP contributed by women	Percentage of NNI contributed by men	Percentage of NNI contributed by women
2010	640,785,573,314	786,763,243,900	18%	22%	22%	27%
2000	412,350,252,854	577,107,220,521	17%	24%	23%	32%

Table 13.

Opportunity Cost Method, Germany						
Year	Contribution by men, in €	Contribution by women, in €	Percentage of GDP contributed by men	Percentage of GDP contributed by women	Percentage of NNI contributed by men	Percentage of NNI contributed by women
2012	512,164,006,931	850,374,242,356	19%	31%	22%	37%
2002	506,569,883,131	869,168,124,694	23%	39%	28%	49%

5.4 Market Valuation Method

5.4.1 General Population

To calculate a value for Bergman's approach, the MM, we use the formula above. We separate by genders, and use the imputed values given by the MM, which we then multiply with hours worked by each gender. We take these two numbers times the days, which gives us the value per individual per year by gender, we multiply this with corresponding population size, and add the two sums together to give us an estimate of the contribution according to the MM. Finally, this value is divided by GDP and NNI to give us an estimate of the size in relation to the national accounts. This is done for both countries.

Table 14.

Value Table Market Valuation Method		
Sweden	2010	2000
Value per hour in SEK, Men:	450	300
Household work per day in hours by Men, in decimal form:	3.03	2.87
Household work per day in hours by Women, in decimal form:	3.84	4.13
Days:	365	365
Men:	2,645,067	2,788,580
Women:	2,567,460	2,706,180

Table 15.

Market Valuation Method, Sweden			
Year	Contribution by the general population, in SEK	Contribution to GDP	Contribution to NNI
2010	3,095,116,845,774	88%	105%
2000	1,992,318,927,300	84%	112%

5.4.2 Men and Women

To use the MM but separate by gender, we repeat the steps above but this time we skip the step off summing together the value per year by person separated by gender. Once we have our estimate for the population size by gender, we divide this value by GDP and NNI to give

us an estimate of roughly how large household production is compared to GDP and NNI, by gender.

Table 16.

Market Valuation Method Sweden						
Year	Contribution by men, in SEK	Contribution by women, in SEK	Percentage of GDP contributed by men	Percentage of GDP contributed by women	Percentage of NNI contributed by men	Percentage of NNI contributed by women
2010	1,389,308,861,860	1,705,807,983,914	39%	48%	47%	58%
2000	830,286,531,300	1,162,032,396,000	35%	49%	47%	65%

5.5 Growth in GDP and NNI

To calculate the effects on growth for GDP and NNI, we need both GDP & NNI, as well as GDP & NNI including household production. We then measure growth for both countries by using the following formula:

$$\frac{(Present\ value - past\ value)}{Past\ value} \cdot 100$$

Table 17.

Value Table for Growth					
Sweden, in SEK	2010	2000	Germany, in €	2012	20000
GDP	3,519,994,000,000	2,380,358,000,000	GDP	2,754,860,000,000	2,209,290,000,000
NNI	2,960,965,000,000	1,778,677,000,000	NNI	2,292,787,000,000	1,780,261,000,000
GS	995,262,907,776	706,755,338,125	GS	588,643,947,123	650,679,962,754
OC	1,427,548,817,214	989,457,473,375	OC	1,362,538,249,288	1,375,738,007,825
MM	3,095,116,845,774	1,992,318,927,300			

Table 18.

Growth in GDP and NNI			
Sweden 2000-2010		Germany 2002-2012	
Growth rate GDP unadjusted	48%	Growth rate GDP unadjusted	25%
Growth rate NNI unadjusted	66%	Growth rate NNI unadjusted	29%
Growth rate GDP GS	46%	Growth rate GDP GS	17%
Growth rate NNI GS	59%	Growth rate NNI GS	19%
Growth rate GDP OC	47%	Growth rate GDP OC	15%
Growth rate NNI OC	59%	Growth rate NNI OC	16%

Growth rate GDP MM	51%	
Growth rate NNI MM	61%	

6 Results, Analysis, and Conclusions

What we can see from a first glance is that we have what I would like to call two headlines. The first is that for all methods applied GDP and NNI increased significantly. The second major result is that in all cases, except for the MV method in Sweden applied to GDP, GDP and NNI growth declined over the respective 10-year period. This also relates to that for all methods for both countries, except for the MV as part of GDP, household production declined in relative size to GDP and NNI. Three further results must also be taken into consideration; in all cases, women contributed the largest part. In all cases, NNI was affected more strongly than GDP. Moreover, in all cases the OC method provided a larger contribution than the GS method. However, for Sweden the MV method contributed more than the OC result. Yet, all of these have rather obvious explanations, which will be touched upon in a bit.

If we go into detail of the results for Sweden we can note that in general the, raw contribution in SEK, according to my results, increased in all cases. However, in all cases except for the MV method and GDP, we also see the relative size of the household sector decreases in relation to GDP and NNI. Further we can see that while the contribution by Women has decreased across the board, this having an obvious explanation as well, when we split the contribution by gender , we can see that in *Table 7* and *Table* 12 that the contribution by men, while still smaller than what women contribute, has increased over the time period concerned.

In general we can see that the relative contribution to GDP has stayed roughly the same in Sweden between 2000 and 2010 with the GS method, around 30 % of GDP, while decreasing a bit more in relation to NNI, as seen in *Table 5*. For the OC method, we can note from *Table 10* that GDP contribution is about 12 % larger, at around 40 %, while NNI contribution is larger still at 48 % in 2010. Finally, for the MV method, GDP contribution has increased from 84 % to 88 % as visible from *Table 15*, while NNI has decreased from 112 % to 105 %, but still by far the largest in relation to any measure. If we look at *Table 18* we see that in general GDP growth was not affected too strongly, ranging within ± 3 % points of the unadjusted measure. For NNI the results on growth were always lower, however, only by between 7 % and 5 % depending on measure.

If we move on to the results from Germany, we can immediately note from *Table 6* and *Table 11* that even in absolute numbers, the contribution has decreased between 2002 and 2012. If we go into further detail we can note from *Table 13* that the contribution by men in absolute numbers increased ever so slightly, while still decreasing in relative size, however we see a decrease in both absolute and relative numbers for women. If we look at the corresponding table for the GS method, *Table 8*, we note that both absolute and relative contribution has gone down for both genders. Further we can see that the contribution according to the GS method, *Table* 6, in total for GDP and NNI has decreased with about 8 points and 11 points respectively, reflecting the decrease in absolute contribution. Moreover for the OC method, we can note from *Table 11* an even stronger decrease in contribution, for GDP we see a decrease of 13 points in relative size, and for NNI we see a decrease of 18 points, this is also visible in *Table 18* when we look at the adjusted growth rates. For GDP growth has declined from 25 % to between 15-17 %, and for NNI it has declined from 29 % to between 16 %-19 %.

The question then becomes how we can explain these results. If we start by analysing it from a perspective based on the calculations I have done, we remember that the general formula used was $(V \cdot T_M \cdot D \cdot P_M) + (V \cdot T_W \cdot D \cdot P_W)$. Hence, what we should look for is a change in any of the variables.

For Sweden we can note from *Table 3,* that population has stayed roughly the same increasing with about 5 %. For obvious reasons the amount of days have stayed constant as well, leaving us with a change in either *T* or *V* to explain any change in results. As is visible from *Table 4* and *Table 9* the time spent on household work has increased slightly for men, while it has decreased slightly for women. If we convert it from decimal form to minutes, it translates to a bit more than 9 minutes more for men and about 17 minutes less for women. This amounts to a decrease of roughly 7 % in time spent on household work by women, and an increase of about 5.6 % by men. This leads to that the major explanation for an increase in absolute contribution, can be attributed to the values imputed. For the GS method the imputed value increases with about 40 SEK per hour, translating to an increase of 36 %. For the OC method we see an even larger increase, of around 58 SEK per hour, amounting to an increase of 39.3 % over the time period. While finally for the MV method we see an increase with 150 SEK per hour, equalling an increase of 50 %.

Thus, looking at my method used and the values I have based my calculations on, it is clear to see that the numerical explanation is that population size has had a slight positive effect, so

has the increased amount of time spent on household work by men. While the decreased amount of time spent on household work by women has had a negative effect. Yet the largest explanation for the increase in valuation of the household sector must be attributed to the increase in imputation values. While in all cases for Sweden, except for the MV method in relation to GDP, the relative size has decreased despite the absolute increase, this is due to the fact that as long as GDP and NNI increased more than the contribution by each method, it will have the effect of anchoring the growth and slowing it down. For the MV method to GDP on the other hand, it accelerated growth due to the large increase of 50 % in the value of each hour not only compensating for the decreased time spent in total by the population, but exceeding GDP growth and thus allowing for a larger relative size.

If we look at the numerical results for Germany, we again start by looking at the change in variables. In contrast to Sweden, the population of Germany between the ages of 20 to 64 has declined, from 51 million to 49 million, as visible in *Table 3.* This equals a decrease of about 3.9 % in population size. When we look at the time spent on household work for Germany we can see from *Table 4* and *Table 9* that time spent on household work has decreased for both genders. If we convert the decimal form into minutes, we see that women on average spend over half an hour less on household work, equalling a decrease of 11.8 %. For men we see a decrease of about 11.5 minutes, which is equal to a decrease of about 7.5 %. If we look at the imputed values for Germany, we can see from *Table 4* that the value per hour for the GS method hardly increased at all between 2002 and 2012, only 40 cents, which is an increase of only 4.5 %. For the OC method we can see a much larger increase of 7 € per hour, or an increase of 30.8 %. As we saw from *Table 6* and *Table 11* the overall contribution in absolute numbers decreased from 2002 to 2012 for both methods, this helps to explain why the growth in Germany decreased so much when adding the imputed values. While the GS method decreased more in absolute numbers than the OC method, it made up a much smaller part of GDP than the OC method, and so had less of an effect in weighing down GDP and NNI growth than the OC method. For the sake of clarity, I have summarized the change in variables below.

Table 19.

Change in Variables		
	Sweden, 2000-2010	Germany 2002-2012
Hourly compensation in GS method, in %	36.0%	4.5%
Hourly compensation in OC method, in %	39.3%	30.8%

Hourly compensation in MV method, in %	50.0%	N/A
Household work by men, in %	5.6%	-7.5%
Household work by women, in %	-7.0%	-11.8%
Household work by men, in minutes	10	-11
Household work by women, in minutes	-17	-31
Population aged 20-64, in %	5.4%	-3.8%
Labour force participation, in % of women	0.6%	7.4%
Labour force participation, in % of men	1.1%	3.8%
Labour force participation, in % of both genders	0.6%	5.6%

If we go on to try to explain what I above called the three results with obvious explanations. It is only natural that all else equal, the method with the highest imputation value will constitute the largest part of GDP and NNI, explaining why the OC method in all cases contributed more than the GS method. The same logic applies to why women in all cases contributed more than men, as I chose to use the same imputation values for both genders, but women in all cases spent more time on doing household work. And finally, given that NNI for both Germany and Sweden always was lower than GDP, any imputation will always be larger in relative size to NNI than to GDP.

However, when it comes to what I above called the second headline, things are less clear. While I have touched upon what part of my equation has led to a decrease, the question becomes why has the household production not kept up with the growth in the national accounts. There are as mentioned above two reasons for this, growth rates in the imputation values not keeping up, and decreasing amounts of time spent on household work**.** When we look at the imputation values, we see that for Germany in particular, the wages of custodian work have just not kept up with GDP growth. The same holds true, but to a smaller extent, for the GS and OC method in regards to Sweden, and OC method in Germany. Given that my methods are based on the wages of either what is a low-paying and relatively unqualified job, or on the average individual in society, low-end wages not keeping up, or rising inequality in wages could both be possible explanations that would diminish household production in relation to the national accounts. However, both explanations fall outside the scope of my thesis and it is only one possible explanation at this stage.

When it comes time spent doing household work, a decrease in relative size is only natural when an individual spends less time doing household work, yet the question remains, why do individuals spend less time doing household work. One possible explanation is that it is a

conscious decision of working more on the market rather than at home. However, as seen, annual hours worked have gone down in both Germany and Sweden, this seems unlikely. Another possible explanation is that productivity in the home has increased, and so less time is required. If this would be the case, my method based on valuing time, would not capture such a productivity increase. Another possible explanation, is that given increasing GDP and salary levels, households get their goods and services from the market or the government instead, that is to say for example more childcare, more restaurant visits. As such, we would be dealing with a marketization, or possibly a nationalization of sorts, of household production. Yet, this remains only speculation.

An interesting comparison is then possible to make, while women in both countries spend less time doing household work, men in Sweden compensated by increasing their household work slightly. At the same time, both the hourly compensation for the OC and GS method went up for Sweden. In Germany on the other hand, both genders worked less in the home, while simultaneously hourly compensation according to the GS method stayed at nearly the same. For the OC method, hourly compensation did increase, though with slightly less than the comparative numbers from Sweden. What is possible to be argued then, is that while labour force participation in Sweden stayed roughly the same for both genders and in total, in Germany it has increased quite significantly. For women participation rates have increased a staggering 7.4 percentage points, while for German men it has increased with about half as much at 3.8, which is still significantly above the increases seen in Sweden. It is thus possible to argue that at least part of the increase in GDP and NNI in Germany is due to the higher participation rates and is a transfer from household production, which is normally excluded from GDP, to production that falls within the production boundary. This would mean that part of the GDP growth of Germany as such would not necessarily constitute an increased production, furthermore, while I above said that annual hours worked have decreased, that does not mean that the total amount of hours have. It is possible, that for most individuals, household work has stayed the same, but for a few households and individuals things have changed significantly. When participation rates have gone up, individuals have entered the labour market and are now working on the market, rather than at home. This would lead to a decrease in time spent on doing household work on average for the nation, while at the same time increasing labour participation rates, yet for most individuals life could look roughly the same, meaning no increase in productivity at home, or increase in goods purchased from the market.

Sweden on the other hand, which has had largely constant participation rates, has growth that does not seem to be based on a transfer from the household sector, many of the signs above are missing, as participation rates have only gone up marginally. Sweden also has had far less of a decrease in time spent on household work. Even though women have decreased their workload, and still do the majority of the household work, men have increased their share to compensate on a nationwide basis. Further, the growth in the national accounts in general seem less affected by the imputed values, as they in general grew close to the rate of GDP and NNI, if slightly lower.

The conclusions we can draw from this are four. First is that the method of imputation significantly influences what results one gets. Second, in all cases the household production was sizeable, in relation to the economy at large. Even in the most conservative estimate, Germany 2012 according to the GS method, household production made up about 20 % of GDP, and we must remember that these results do not account for individuals above the age of 64, which spend a much larger proportion of their time on household work. The third conclusion is that in all cases but one, growth slowed down when accounting for household production, indicating that we are potentially overestimating the increase in total production in society. Fourth, not only does household production potentially make up a large part of production and services in Germany and Sweden, but also it is still changing, further complicating any comparisons both in time and between countries.

If I were to be critical towards my own study, I would recommend focusing on the difference between the market value of household production, what a household produces, and the welfare said production adds to society. Even my most conservative estimates is problematic, as it assigns a monetary value based on the market salary of a custodian. Due to the problems in using an output based measure for household production, it is also difficult in coming up with a different estimate. When it comes to my recommendations for future research on the subject, I would believe that any future study trying to classify what the exact services and products are that are produced in a household, as well as the quality of said services and products, would be of immense use. The input method does allow estimates to be made, but until better knowledge has been acquired on exactly what it is that households produce, and what the equivalent market product and price is, that is what it will remain – estimates based on different approaches.

References

Beneria, L. (2003). *Gender, Development, and Globalization Economics as if All People Mattered*. New York: Routledge.

Bergman, M. (2003). Hemarbetet och BNP. *Ekonomisk Debatt*, 31(3), 60-67. Retrieved May 22, 2016, from http://nationalekonomi.se/filer/pdf/31-3-mb.pdf

Blau, F. D., Ferber, M. A., & Winkler, A. E. (1998). *The Economics of Women, Men, and Work*. Upper Saddle River: Prentice-Hall Inc.

Burda, M., & Wyplosz, C. (2009). *Macroeconomics A European Text*. New York: Oxford University Press inc. .

Chadeau, A. (1992). What is a Households' Non-market Production Worth. *OECD Economic Studies* No. 18,, 85-103. Retrieved May 22, 2016, from http://www.oecd.org/economy/outlook/34252981.pdf

Coyle, D. (2014). *GDP A Brief but Affectionate History*. Princeton: Princeton University Press.

Destatis. (2004). *Alltag in Deutschland Analysen zur Zeitverwendung*. Wiesbaden: Statistisches Bundesamt. Retrieved May 23, 2016, from https://www.destatis.de/DE/Publikationen/Thematisch/EinkommenKonsumLebensbedingungen/Zeitbudgeterhebung/Alltag1030443049004.pdf?__blob=publicationFile

Destatis. (2009). *Verdienste und Arbeitskosten Verdienststrukturerhebung 2006*. Wiesbaden: Statistisches Bundesamt. Retrieved May 20, 2016, from https://www.destatis.de/DE/Publikationen/Thematisch/VerdiensteArbeitskosten/VerdiensteBerufe/VerdienstenachBerufe5621108069004.pdf?__blob=publicationFile

Destatis. (2013). *Verdienste und Arbeitskosten Verdienststrukturen*. Wiesbaden: Statistisches Bundesamt. Retrieved May 20, 2016, from

https://www.destatis.de/DE/Publikationen/Thematisch/VerdiensteArbeitskosten/VerdiensteBerufe/Verdienststrukturerhebung2162001109004.pdf?__blob=publicationFile

Destatis. (2014). *Methodik und Durchführung der Zeitverwendungserhebung 2012/2013*. Wiesbaden: Statistisches Bundesamt. Retrieved May 13, 2016, from https://www.destatis.de/DE/Publikationen/WirtschaftStatistik/WirtschaftsrZeitbudget/Zeitverwendungserhebung_112014.pdf?__blob=publicationFile

Destatis. (2015). *Zeitverwendungserhebung 2012/2013*. Wiesbaden 2015: Statistisches Bundesamt. Retrieved May 20, 2016, from https://www.destatis.de/DE/Publikationen/Thematisch/EinkommenKonsumLebensbedingungen/Zeitbudgeterhebung/Zeitverwendung5639102139004.pdf;jsessionid=F8538E68D4AD5C99DFAC20AD3600ADA7.cae3?__blob=publicationFile

Destatis. (2016 A). *Population: Germany, Reference date, Age, 1970-2014*. Wiesbaden: Statistisches Bundestamt. Retrieved May 13, 2016, from https://www-genesis.destatis.de/genesis/online;jsessionid=EDA71E471EE5C570EB53566590EC170C.tomcat_GO_1_2?operation=previous&levelindex=2&levelid=1463500911780&step=2

Destatis. (2016 B). *National Accounts of Germany in English*. Wiesbaden: Statistisches Bundesamt. Retrieved May 13, 2016, from https://www.destatis.de/EN/FactsFigures/NationalEconomyEnvironment/NationalAccounts/NationalAccounts.html

Eurostat. (2009). *Harmonised European Time Use Surveys 2008 guidelines*. Luxembourg: Office for Official Publications of the European Communities. Retrieved May 13, 2016, from http://ec.europa.eu/eurostat/documents/3859598/5909673/KS-RA-08-014-EN.PDF/a745ca2e-7dc6-48a9-a36c-000ad120380e?version=1.0

Hemfrid. Städning. Retrieved May 20, 2016, from Hemfrid: https://www.hemfrid.se/stadtjanster/stadning/

Hill, P. T. (1979). Do-It-Yourself and GDP. *Review of income and wealth*, 25(1), 31-39. Retrieved May 24, 2016, from http://www.roiw.org/1979/31.pdf

Jones, C. I., & Vollrath, D. (2013). *Introduction to Economic Growth*. New York: W. W. Norton & Company.

Kendrick, J. W. (1970). The Historical Development of National-Income Accounts. *History of Political Economy*, 2(2), 284-315. Retrieved May 20, 2016, from http://hope.dukejournals.org/content/2/2/284.short

Landefeld, S. J., Seskin, E. P., & Fraumeni, B. M. (2008). Taking the Pulse of the Economy: Measuring GDP. *Journal of Economic Perspectives*, 222(2), 193-216. Retrieved May 4, 2016, from http://www.bea.gov/about/pdf/jep_spring2008.pdf

Mankiw, G. N. (1998). *Principles of Economics.* Fort Worth: The Dryden Press.

Nordhaus, W. D., & Tobin, J. (1972). Is Growth Obsolete? *NBER Economic Research: Retrospect and Prospect*, Volume, 5, 1-80. Retrieved from http://www.nber.org/chapters/c7620.pdf

OECD. (2016 A). *Average annual hours actually worked per worker*. Retrieved May 19, 2016, from OECD.Stat: https://stats.oecd.org/Index.aspx?DataSetCode=ANHRS

OECD. (2016 B). *Average annual wages*. Retrieved May 20, 2016, from OECD.stat: https://stats.oecd.org/Index.aspx?DataSetCode=AV_AN_WAGE

Pigou, A. C. (1920). *Welfare*. 4th ed. London: Macmillan and Co.

SCB. (2001). *Lönestatistisk årsbok 2000*. Örebro: Statistika centralbyrån. Retrieved May 20, 2016, from http://www.scb.se/sv_/Hitta-statistik/Publiceringskalender/Visa-detaljerad-information/?publobjid=1717

SCB. (2002). *Statistisk årsbok 2002*. Örebro: Statistiska Central Byrån. Retrieved May 24, 2016, from http://www.scb.se/sv_/Hitta-statistik/Publiceringskalender/Visa-detaljerad-information/?publobjid=1615

SCB. (2003). *Tid för vardagsliv kvinnors och mäns tidsanvändning 1990/91 och 2000/01 Levnadsförhållanden Rapport nr 99*. Örebro: Statistiska centralbyrån. Retrieved May 3, 2016 from http://www.scb.se/statistik/le/le0103/2003m00/le99sa0301.pdf

SCB. (2012). *Levnadsförhållanden rapport 123, Nu för tiden. En undersökning om svenska folkets tidsanvänding år 2010/11*. Örebro: SCB. Retrieved from http://www.scb.se/statistik/_publikationer/LE0103_2010A01_BR_LE123BR1201.pdf

SCB. (2013). *Statistisk årsbok 2013*. Örebro: Statistiska Central Byrån. Retrieved May 24, 2016, from http://www.scb.se/sv_/Hitta-statistik/Publiceringskalender/Visa-detaljerad-information/?publobjid=1615

SCB. (2016 A). *Folkmängden efter region, civilstånd, ålder och kön. År 1968 - 2015*. Örebro: Statistiska central byrån. Retrieved May 20, 2016, from http://www.statistikdatabasen.scb.se/pxweb/sv/ssd/START__BE__BE0101__BE0101A/BefolkningNy/?rxid=c5ea95ac-67f8-4e05-8c27-3ba0aa845fad

SCB. (2016 B). *Genomsnittlig månadslön efter sektor 1992-2014*. Retrieved May 20, 2016, from Statistiska Centralbyrån: http://www.scb.se/sv_/Hitta-statistik/Statistik-efter-amne/Arbetsmarknad/Loner-och-arbetskostnader/Lonestrukturstatistik-hela-ekonomin/14367/14374/149087/

SCB. (2016 C). *Lönedatabasen*. Retrieved May 20, 2016, from Statistikdatabasen.scb: http://www.statistikdatabasen.scb.se/pxweb/sv/ssd/START__AM__AM0110/

SCB. (2016 D). *Tidsanvändningsundersökningen*. Retrieved May 18, 2016, from SCB: http://www.scb.se/sv_/Hitta-statistik/Statistik-efter-amne/Levnadsforhallanden/Levnadsforhallanden/Tidsanvandningsundersokningen/#documentation_

Silbaugh, K. (1996). Turning Labor into Love: Housework and the Law. *Northwestern University Law review*, 91(1), 1-86. Retrieved May 24, 2016, from http://heinonline.org/HOL/LandingPage?handle=hein.journals/illlr91&div=7&id=&page=

SNA. (1953). *A System of National Accounts and Supporting Tables*. New York: United Nations Department of economic affairs statistical office. Retrieved May 13, 2016, from http://unstats.un.org/unsd/nationalaccount/docs/1953SNA.pdf

SNA. (2009). *System of National Accounts 2008*. New York: European Communities, International Monetary Fund, Organisation for Economic Co-operation and Development, United Nations and World Bank. Retrieved May 13, 2016, from http://unstats.un.org/unsd/nationalaccount/docs/SNA2008.pdf

Stiglitz, J. E., Sen, A., & Fitoussi, J.-P. (2009). *Report by the Commission on the Measurement of Economic Performance and Social Progress*. Retrieved May 3, 2016, from http://www.insee.fr/fr/publications-et-services/dossiers_web/stiglitz/doc-commission/RAPPORT_anglais.pdf

Studenski, P. (1961). *The Income of Nations*. New York : New York University Press.

The Economist. (2016). *The Trouble with GDP*. Retrieved April 20, 2016, from The Economist: http://www.economist.com/news/briefing/21697845-gross-domestic-product-gdp-increasingly-poor-measure-prosperity-it-not-even

Waring, M. (1989). *If Women Counted A New Feminist Economics*. London: Macmillan.

Wood, C. A. (1997). The First World/Third Party Criterion: A Feminist Critique of Production Boundaries in Economics. *Feminist Economics*, 3(3), 47-68. Retrieved May 13, 2016, from http://dx.doi.org/10.1080/135457097338654

World Bank. (2016). *Social Protection & Labor*. Retrieved May 19, 2016, from World bank: http://data.worldbank.org/topic/labor-and-social-protection?display=graph