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***Redesigning the Swedish VAT system – Room for
Pareto improvements?***

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Abstract

This paper investigates the characteristics and history of value added taxes. Many previous studies have focused on the theoretical implications of value added taxes; this paper differs in the method used as well as the phrasing of research question. This paper seeks out to answer whether a redesign of the current Value Added Tax system in Sweden could be a Pareto improvement. It looks at relevant economic theory of taxation and elasticities; empirical and historical background as well as data on food expenditures to analyze the effects of a redesign. In the case of reduced welfare, compensatory reforms are suggested. The main finding is that a redesign of the Swedish VAT-system where the reduced rates are removed and the standard rate lowered could lead to Pareto improvements if this is done in conjunction with some compensatory reforms.

Keywords: Optimal taxation, Value added taxes, Consumption taxes, Price elasticities, taxation in Sweden

Abbreviations

b2c – Business to consumer

b2b – Business to business

EU – European Union

GST – General Sales Tax

MOMS – (Swedish abbreviation for VAT)

OECD - The Organisation for Economic Co-operation and Development

SCB – Statistiska Centralbyrån (Statistics Sweden)

SOU – Statens offentliga utredningar (Public investigations by the Government Offices of Sweden)

VAT – Value added tax

VRR – VAT Revenue Ratio

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2. Introduction

Since the introduction of value added taxes in the 1960s they have been favored by many economists because of their said efficiency, relatively low administration costs and high compliance levels. There have been several studies carried out on the performance of different types of VAT-designs and the effect of reduced rates. A lot of the research seems to conclude that based on economic grounds reduced rates are not a good idea for various reasons. However following the political debate, daily news or reading OECDs “taxation trends” we can observe that reduced rates and exemptions seem to be increasingly common. In Sweden the exemptions to the initial base and the introduction of reduced rates was first implemented in the 1990s. Looking at the history of VATs we can see that their importance as a revenue collector has been steadily rising. This makes questions regarding the design and role of the VAT an important concern for policy makers.

2.1.Purpose

The purpose of this paper is to apply a theoretical frame work to analyze the possible effects of a redesign of the Swedish VAT system into a broad based single rate system. The theoretical reform that I will be evaluating is a revenue neutral reform of the VAT system where a decrease in the standard rate is offset by removing the present reduced rates of 6 and 12 percent. This is politically a big reform and has not been as frequently discussed by politicians in the public debate as it has been by professionals such as economists and lawyers. A transformation of the VAT-system to remove the reduced rates of 6 and 12 percent is what most often have been suggested, and the main focus have often been on the consequences for different groups of increased food prices. I further seek out to answer whether or not such a reform could lead to a Pareto improvement. In this paper I will focus on the VAT as a general ad valorem tax on consumption. The following questions are the focus of this paper:

- What are the arguments for and against having reduced VAT rates?
- If removing the reduced rates, what would be the new standard rate that would make the reform revenue neutral?
- How would food expenditure be expected to change?
- What would be the consequences of such reform?
- How could possible net-losers of the reform be compensated?

- Is there room for a Pareto improvement in redesigning the Swedish VAT?

In order to answer the questions of this paper I will look into the characteristics of VATs, highlight relevant economic theory; focus on the specific case of Sweden as well as looking at two other countries that have been successful in implementing the kind of framework that I am investigating. These countries are New Zealand and Denmark. New Zealand was chosen because they are the OECD of the country with the broadest base and Denmark because they have a VAT system without reduced rates and share many characteristics with Sweden as well as a similar historic background.

2.2. Delimitations

The suggested reform is already quite controversial as is, therefore this paper will not investigate the consequences of broadening the base to 100 percent coverage of consumption, rather focus will be upon a system with no reduced rates but that still allows the same exemptions at a zero rate as the present system. The reason for this is not that broadening the base to fully cover all consumption is not an interesting issue but it have been theoretically examined in much previous work and is not likely to be viable alternative, for Sweden, in the near future. Specific taxes on certain goods and services such as alcohol, tobacco or fuel are in this paper assumed to be the same as in the present system and will therefore not be focused upon. This paper will not put emphasize on the dynamical effects on the economy that a redesign of the VAT system might lead to. Neither will it focus on how households will substitute between different goods and services nor on the effect for exporting companies. Effects on inflation from changes in price and quantities due to the reform will be disregarded.

2.3. Disposition

This paper is roughly constructed by five different parts. The first part introduces the reader to background knowledge of VATs and their characteristics. The second part treats methodology and data choices made in this paper. The third part is a run through of relevant theory that conclusions and analysis rely on. The fourth part looks at empirics concerning Sweden, it compares Sweden to Denmark and New Zealand as well as studies food expenditures and policy actions. The fifth part consists of discussion, suggestions for future research and concluding remarks.

3. Background

3.1. VAT

A value added tax is generally a tax on consumption within a country and not necessarily a tax on the value added like the name suggests. There are different names for this sort of consumption taxes and VAT is by far the most widely used one. A value added tax normally consist of a single broad base rate applied to all or at least most consumption goods and services but can also be specific ad valorem or excise taxes for certain goods, a common example is tobacco. Most countries have exemptions with reduced rates or zero rates. In the 1960s less than 10 countries had a VAT system and since then over 150 countries have adopted a general consumption tax making it widely popular tax (OECD, 2012. p 28). VAT has often been favored by economists mainly due to efficiency reasons. The importance of VAT in raising government revenue has increased rapidly from when first introduced in the 1960s. According to OECD (2012, p. 28-29) around 31 percent of governmental revenues collected 2006 in OECD countries stems from value added taxes. Of this revenue about one third came from specific taxes such as Pigout-taxes on alcohol and tobacco and about two third came from general consumption (OECD, 2012. p. 29).

Criticism of VAT is often driven by fairness arguments and its lack of progressiveness. However using reduced rates and zero exemptions as a means to achieve a more equal distribution in living standards have often been pointed out as an inefficient strategy by economists. Reduced rates tend to come at a large cost for the society and are generally believed to reduce compliance levels; this will be further looked in to in section 2.2 and 2.4. There are two main methods in use for collecting VAT revenues, the invoice-credit system and the subtraction system. The former is by far the most popular method and is used by all OECD countries except for Japan (OECD, 2012. p. 32).

3.2. Reduced rates

Many countries have one or more reduced rates, including zero rates, in addition to their standard rates. Reduced rates are often introduced on fairness grounds to achieve redistribution goals. Common exemptions are food, health care, education and medicine. Policy makers argue that because poor people spend a larger share of their income on for example food the proportional tax burden is higher on the poor, even though consumers with higher levels of income tend to bear more of the burden in absolute terms.

There can also be other objectives for exemptions other than distributional, for example to support certain industries or increase employment. Using the VAT to achieve employment objectives are an indirect mean and is generally not considered to be very efficient. There are suggestions that countries with a high standard rate, such as Sweden and Denmark, could be more successful in reaching employment objectives by widening the base and applying a lower rate rather than exempting certain industries.

Reduced rates also tend to cause issues on how to decide which exemptions that should be introduced and can create significant productivity distortions. It can also be difficult to achieve transparency in the decision process and politicians might be driven by self interests or be affected by lobbyist groups rather than by economic efficiency (Benge et al 2013. p 18). Empirical work seems to conclude that reduced rates encourages rent seeking and increases compliance costs. There is some consensus on progressive income taxation or targeted expenditure policies such as subsidies as more appropriate means to reach distributional objectives than by introducing exemptions to the VAT base (OECD, 2008. p. 53).

Another reason that countries exempt goods or apply reduced rates is positive externalities. A merit good is a term used to describe goods or services that ought to be provided regardless of whether consumers demand or not (Rosen & Gayer, 2010. p. 49). The arguments behind this provision could be to meet other social objectives such as cultural diversity, because of historical traditions or because consumption of such goods are believed to produce positive externalities. According to the OECD governments should be careful with subsidizing consumption of merit goods by reduced VAT rates because this often leads to unintended outcomes where high-income earners benefit at the cost of the society at large rather than the intended low-income groups increasing their consumption of such goods (OECD, 2012. p. 72).

3.3. Thresholds for VAT registration

Exemptions from paying VAT can be made accordingly to providing goods or services that are not included in the VAT base as previously mentioned, however can also be made through the existence of a threshold. Businesses with annual revenue beneath the threshold are not obliged to charge VAT on top of their price meaning that the consumer price is the same as the sale price. Some countries have different thresholds for registration and collection. The reason for having a threshold is that the tax imposes costs both for firms as well as for the tax authorities,

in the case of small businesses with very low turnover the administrative burden of compliance might be greater than the actual revenue raised. Another reason in some countries is supporting small businesses by giving them extra tax relief. The main argument against having a threshold for VAT collection is that it creates distortions and if the threshold is relatively high, as for example in Australia, it creates incentives for businesses to keep their turnover on a lower level to remain under the limit. Whether it is more efficient for a country to have a threshold for VAT collection or not depends on a few factors such as possible production distortions, efficiency of tax collector, and the administrative burden on firms from VATs.

3.4. VAT Revenue Ratio

To measure the efficiency and compliance of a tax on consumption the OECD, amongst others, use the VAT Revenue Ratio. The VRR is computed accordingly:

$$VRR = \frac{VR}{(FCE - VR) * r}$$

Where VR = VAT revenue raised, FCE = Final Consumption Expenditures, r = the standard rate (OECD, 2012. p. 106).

The denominator is therefore theoretical revenue that would be raised if the standard rate was applied to all final consumption. This ratio is generally between 0 and 1. The gap between the VRR ratio and 1 reflects two different aspects, a compliance gap and a policy gap (OECD, 2012. p. 110-111). The former is due to tax evasion, thresholds or failure to collect revenue. The latter is due to the design of the VAT system, which exemptions that are in place. Most OECD countries have a VRR between 0.5 and 0.7. New Zealand is a standout example and had a VRR of 0.98 (ibid. p. 111). The VRR neither should nor can be used alone to evaluate the efficiency or the quality of a countries VAT-system. Instead it should be seen for what it is, a gross estimate of the gap between theoretical revenue compared to actual revenue raised. OECD concludes in their "Taxation trends" that this indicator are better suited for time comparisons within a country than between different countries. It is of large importance to the society to evaluate the actual costs of keeping reduced rates and exemptions compared to changing to a more pure system. The example of New Zealand will be highlighted in section 6.3.

3.5. Compliance gaps

Compliance gaps are the difference between the theoretical revenue that should be raised with exemptions and reduced rates in place and the actual revenues raised. This gap arises because of tax evasion and failure to collect revenues. According to a study carried out in 1996 by Agha and Haughton they found the standard rate to be significantly negative for compliance on a 5 percent significance level (Agha & Haughton, 1996. p. 306). In Taxation Trends from 2008 OECD concludes that there does not seem to be a correlation between the VRR the level of the standard rate since countries with widely ranging standard rates still have a VRR ranging between 0.5 and 0.65 (OECD, 2008. p. 70). Most research seems to conclude that introducing exemptions from the base reduces compliance levels. Agha and Haughton also find a positive correlation between time and compliance meaning that the longer a VAT-system has been in place the higher the compliance.

3.6. Policy gaps

The policy gap can be defined as the difference in the revenue that would be raised if the standard rate was applied to all final consumption and the revenue raised by adding the products of the standard rate multiplied by its base and the reduced rates multiplied by bases. The difference between the two is the governmental cost of forgone revenues by keeping the reduced rates. Differences in policy gaps seem to be main cause for differences between countries.

3.7. VAT in Sweden.

Sweden first implemented its VAT system in 1969 (The Swedish Tax Agency, 2013. p. 186). Sweden has, together with Denmark and Norway, the highest standard rate of OECD countries. The VAT standard rate is 25 percent and there are two reduced rates of 12 and 6 percent as well as a zero rate. The 12 percent rate applies to food, restaurant and catering services, hotel stays and camping stays. The 6 percent rate apply to most public transport, transport in skilifts, books, magazines & newspapers, admissions to cultural events, sports, admission to zoological gardens. The zero rate apply to for example health care, education, postal services, financial services, insurance, pharmaceuticals sold on prescription and rental & sales of immovable property (ibid. p. 188). In 1990-1991 substantial transformations of the Swedish taxation body was induced to guarantee financial stability and secure revenues. The standard VAT rate was temporarily raised from 23,46 percent to 25 percent (SOU 2006:90, p. 63). Instead of returning to the initial pre standard rate level it was decided to implement the reduction through a reduced rate for food, motivated by inflation targeting (ibid. p. 63-64).

Since the reform in 1990-1991 multiple reforms of the VAT system have been carried out. In 1996 the reduced rate on food was lowered to 12 percent which is the current rate for food. This was motivated as compensation because of a reduction of coverage levels in the social security system (ibid. p. 66). The coverage levels were brought back to initial levels in 1997-1998 but the government decided to maintain the reduced rate for food.

In 2011 consumption taxes raised around 455 billion SEK (nominal prices). Of this revenue about 332.5 billion SEK came from VAT and about 122.5 billion SEK came from specific taxes such as tax on alcohol, tobacco, energy etc. value added taxes on general consumption contributed to circa 21.5 percent of total tax revenues raised (SCB 1, 2014).

Since Sweden is a part of the European Union they are not completely free to design their VAT-system as they wish but need to do so within the EUs framework. At the moment that framework regulates member countries to apply a standard rate of minimum 15 percent and to allow for a maximum of two reduced rates of minimum 5 percent as well as a zero rate however they have granted membership countries a number of deviations (The Swedish Tax Agency, 2013. p. 188).

According to the Swedish tax authorities all agents, private as well as public, providing goods or services that are not part of the exemptions should register and pay VAT, although in *Consumption Tax Trends* the OECD reports Sweden to have a threshold of 30 000 SEK for registration and collection (OECD, 2012. p. 84). Firms that solemnly provide goods or services that are exempt from VAT are unable to claim receivable VAT paid on any of their inputs.

4. Methodology

4.1. Methods in economic research

When conducting academic work there are three main objectives that one strives to achieve in ones work. These are transparency, reproducibility and relevance. Transparency means that any conclusions or arguments presented in the work are well documented, that it is possible to distinguish between materials or thoughts added by the author and previously published material processed in the work. It should be clear for the reader what and why the paper concludes. Reproducibility is especially important in work that uses quantitative methods or controlled experiments. It means that another, independent, academic should be able to use the same method conducted to control that results contained are general. If the method undertaken fails to achieve the goals of transparency and reproducibility the significance of the paper diminishes. Relevance means that the question that the paper undertakes should have importance either for further theory development within the field or because it provides insights within a specific matter that is of use for the field, other fields or policymakers.

Methods used for economic research can on an aggregate level be divided in to two categories, quantitative and qualitative. Examples of quantitative methods are different types econometrical regressions based on collected data. Qualitative methods include for example case studies, comparative studies and document analysis. Economic research is usually based mainly on quantitative methods because of the greater levels of reproducibility. By using a qualitative method, as is the case in this paper, more emphasis is put on transparency and relevance to motivate its significance. It is of great importance that the theoretic grounds that are chosen are relevant and applicable.

I have decided to base my work on a mixture of document analysis and a case study. The process of deciding on a framework for a government to gather revenue is complex and driven by many different factors. By mixing these two methods it was possible to look at general characteristics of consumption taxation, specific characteristics for Sweden as well as economic theory to get a deeper understanding and hopefully succeeding in answering the questions of this paper. I am aware that my choice on methods can be questioned on the basis of relevance and reproducibility since no quantitative method was used. However I hope that by clearly explaining and discussing my choice of data and theory this paper will still be significant because of high transparency and seeking out to highlight an important policy issue.

4.2. Case study

When conducting a case study the author seek out to answer the questions of the paper by focusing on a specific case. This is a qualitative method that takes case specific characteristics in to consideration as well as trying to put the issue into a broader context. The downside of case studies can be that they sometimes lack relevance for the field and are hard to reproduce therefore giving less weight to the results. Often a case study can be conducted and if the results motivate further research a new study using a quantitative method can be undertaken to see if the results from the initial case study holds.

4.3. Document analysis

Document analysis is a qualitative method that is based on reviewing already existing material and putting it in a new context. A positive characteristic of document analysis is that it is time and cost-efficient to use already existing material and it can provide important insights to how well established models apply to an empirical context. A negative characteristic could be lesser relevance since no new material is presented.

4.4. Data

All data used for this paper is secondary. Most of the data used is collected from the Swedish Bureau of Statistics (SCB) and is gathered continuously through household surveys and official data provided by the government, companies and authorities. In much of the data that is based on household surveys the participation rate are quite low and therefore this data should be used with caution. Since the method undertaken is mainly a theoretical and empirical analysis and no exact critical value is defined the impact of uncertainty regarding the validity of some of the data might be less substantial than for other quantitative methods where conclusions might be heavily affected by measurement errors in available data. I have tried to find all data needed from the first hand source, in those cases where that has not proved possible for different reasons it is clearly marked out.

4.4.1. Data concerning household expenditures

There have been trade-offs in deciding whether to use the most recent data available, generally that of 2011/2012 or to use the data with highest participation rates which might be more reliable. I have looked at the shares of expenditures estimated both in the data from 2007-2009 which have higher participation rates and more recent data with lower participation rates. In most cases the expenditure shares for different categories does not differ largely. There has also been a trade off between only or mainly using the data collected from

SCB and complementing with data from other sources. An advantage with limiting the use of data to that of SCB is that collection of data undertaken by the bureau is not as likely to be driven by political or lobbying interests as data collected and presented by organizations. This increases the transparency and makes for more accurate comparisons between groups. The advantage of including data from organization, for example data on students' well-being and expenditures presented by CSN is that the material is more comprehensive and more recent.

I decided not to carry out any surveys or to first hand collect any data, quantitatively or qualitatively, there were several reasons for this. Firstly creating data is time consuming, since the OECD, EU, SCB and the Swedish government are supplying much of the data that I needed it was strategically wise to make use of data already publicly available.

In the empirical section where I estimate the outcome for different groups based on data on their current disposable incomes and expenditure shares and levels there have been a difficult trade off between how many groups and expenditure categories that should be included and making the data manageable. The more comprehensive the data subject to analysis is the more likely conclusions and estimates are to reflect reality. On the other hand increasing the material would have heavily increased the complexity in a manner that I perceived as unmanageable for the time frame for this paper. In the data concerning how different groups would be affected by removing the reduced rates and introducing a single rate some individuals will be part of more than one group, this is not controlled for. In some cases the effect for two groups move in the same direction further distinguishing said effect for individuals included in both groups. In other cases effects for individuals of a VAT redesign might be more ambiguous if the effects for the groups counteract each other. This is a reason as to why I have decided not to perform a regression analysis and define a critical value as to whether such a reform should be undertaken or not.

4.4.2. Data concerning VAT revenues

For data over consumption I have used the private and public consumption from the national accounts. However it has been a problem to get any figures on how much of the consumption that is part of the VAT base. The first issue is that some private consumption is exempt from VAT and is therefore not part of the base but I have not been able to find any clarifications on the size of the exempt share. The second issue is that much public consumption is exempt from VAT and nor is VAT charged on most services or goods provided by the public sector, however the public sector still contributes to VAT revenue since VAT is paid on many inputs. I

have been unable to gain information on the size of VAT revenue that is contributed by the public sector. The third issue is that some services and goods administered as investment are subject to VAT and therefore raise revenue and should be part of the base, however are only occurring in the investment parts of national accounts and not consumption. Because of these difficulties in determining the consumption base I could not calculate the theoretical rate, at a 100 percent compliance level, that would generate the same total revenue as the present three rates. As a second best strategy I have decided to use the rates estimated in SOU 2006:90 as a benchmark and make my own calculations based on figures for turnover and payable VAT from the Swedish Tax Agency 2013.

4.4.3. Exclusions in the empirical section

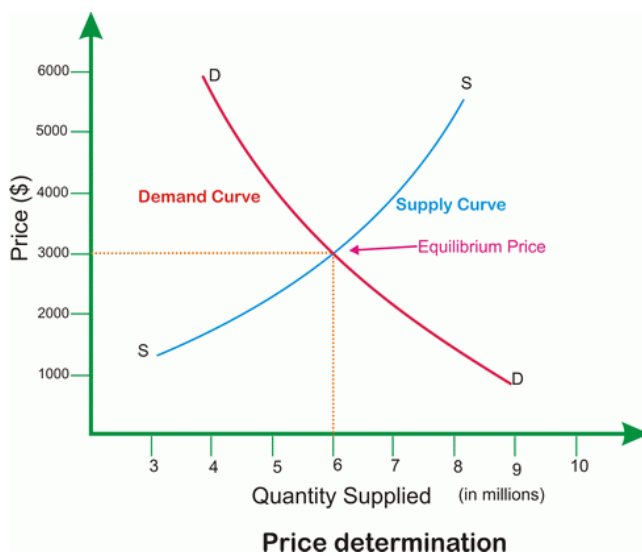
I have decided not to include data on transport and cultural expenditures. This is due to the fact that when SCB gathered data goods and services falling in to these categories are summed together and consist of different types which are subject to different VAT rates. This makes it difficult to make any predictions of whether the ratio of cultural expenditure as a share of total expenditure would increase or decrease as an effect of a reduced standard rate in conjunction with removal of the two reduced rates. If the subcategories in SCB dataset would have been more precisely defined this would not have been an issue. The same reasons apply to why the transport expenditure ratio excluded. I recognize that these are two significant expenditure posts for many consumers but I think that the uncertainty and possible bias that would result from inclusion would off set the gain from trying to estimate their relevance as an expenditure share.

5. Theory

The theoretical focus in this paper is mainly the elasticities of consumers to enable analysis of consumer responses to price changes resulting from the reform and optimal taxation theory regarding the economic definition of efficient methods of taxation.

5.1. Price determination

Equilibrium occurs at the intersection of aggregate supply and demand. The aggregate demand for private goods is computed by horizontal summation of individuals demand curves. Demand is further determined by price, price of complementing goods, price of substitutes and future expectations (Perloff, 2009. p. 12, 17, 24).



Picture 1 Illustrates how the market equilibrium price and quantity are decided by the intersection of demand and supply

5.2. Elasticities

To see how the market will react to a policy change affecting price, quantity or both we look at the elasticities of demand and supply. There are three elasticities that are relevant to look at when trying to determine how the quantity demanded of a good will change in response to a certain action. These are price elasticity, income elasticity and cross-price elasticity (Perloff, 2009. p. 46-52). Which one that should be used, or if more than one indicator should be used, depends on what variable has changed. An elasticity can be defined as the percentage change in a variable resulting from a given percentage change in another variable (ibid. p. 46-66). Elasticities are often referred to in absolute term, which is also the case in this paper.

5.2.1. Price elasticity of demand

The price elasticity of a good is the percentage change in quantity demanded resulting from a given percentage change in the price of the good.

$$\varepsilon_p = \frac{\Delta q/q}{\Delta p/p}, \text{ [Equation 1.1]}$$

where ε_p = the price elasticity of demand, $\Delta q/q$ = the percentage change in quantity demanded, $\Delta p/p$ = the percentage change in price.

Price elasticities are assumed to be negative for downward sloping demand curve indicating that the change in quantity demanded will move in opposite direction from the change in price. Elasticity often varies along with the demand curve especially in the case of a downward sloping linear demand curve. Two extreme cases where the elasticity is constant along the demand curve are in the case of a completely horizontal or vertical demand curve. In the case of a downward sloping linear demand curve the price elasticity tend to be greater the closer to the y-axis and lesser closer to the intersecting point with the x-axis (Perloff, 2009. p. 48-50). When the price elasticity of a good is exactly 1 it is defined as unitary elastic, higher than 1 elastic and less than 1 inelastic.

5.2.2. Income elasticity of demand

Income elasticity is the change in quantity demanded resulting from a given percentage change in income.

$$\varepsilon_y = \frac{\Delta q/q}{\Delta y/y}, \text{ [Equation 1.2]}$$

Where ε_y = the income elasticity of demand, $\Delta q/q$ = the percentage change in quantity demanded, $\Delta y/y$ = the percentage change in income.

The income elasticity can roughly be described as positive, negative or close to zero depending on how the consumer perceives the good. For normal goods the income elasticity is positive, for inferior goods the income elasticity is negative and for necessary goods the income elasticity is close to zero (Perloff, 2009. p. 51, 118-119). Which category that best describes a good varies between consumers and can also vary for different income levels of the same consumer, something that is often shown in an Engel-curve.

5.2.3. Cross-price elasticity of demand

The cross-price elasticity of demand is the percentage change in quantity demanded resulting from a given percentage change in the price of another good.

$$\varepsilon_{p_x} = \frac{\Delta q/q}{\Delta p_x/p_x}, \text{ [Equation 1.3]}$$

Where ε_{p_x} = the cross-price elasticity of demand, $\Delta q/q$ = the percentage change in quantity demanded, $\Delta p_x/p_x$ = the percentage change in price of another good, x.

If the cross-price elasticity is zero the goods are unrelated. If this elasticity is positive the goods are, in some extent, substitutes and if it is negative the goods are, again in some extent, complements (Perloff, 2009. p. 51-52). The higher the absolute value of the cross-price elasticity the closer the goods are to being perfect complements or perfect substitutes.

5.2.4. Price elasticity of supply

The price elasticity of supply for a good is defined as the percentage change in quantity supplied in response to a given percentage change in price.

$$\eta = \frac{\Delta q/q}{\Delta p/p}, \text{ [Equation 1.4]}$$

where η = price elasticity of supply, $\Delta q/q$ = the percentage change in quantity supplied, $\Delta p/p$ = the percentage change in price.

For an upwards sloping supply curve the price elasticity is assumed to be positive. The elasticity of supply often varies along the supply curve just like in the case of elasticities of demand. Theoretically the elasticity of supply can be constant and two extreme examples of this is a horizontal or vertical supply curve (Perloff, 2009. p. 53-54).

5.2.5. Short-run versus long-run elasticities

Elasticities tend to vary depending on which time frame is considered. In general elasticity of both demand and supply are often assumed to be higher, again in absolute terms, in the long run than in the short run since agents have higher possibilities of altering their behavior and needs (Perloff, 2009. p. 56-57). However it should be noted that expectations of the future have an important role in determining the short run elasticity. If a consumer is offered to purchase a good for a price that is lower than average and assumes this to be temporary the change in quantity demanded might be greater than if it was perceived as a permanent change and vice versa for supply.

5.3. Optimal taxation

When introducing any type of taxation policy makers usually face a trade off between efficiency and fairness. Efficiency is thought of as minimizing administrative costs, minimizing production and consumption distortions while achieving a high level of compliance (Rosen & Gayer, 2010. p. 365, 375). Fairness of a tax depends on the beliefs of an individual but is often discussed in terms of vertical and horizontal equity (ibid. p. 356-357, 366-369). Vertical equity means that the burden of a tax should be distributed fairly between groups with different abilities to pay (ibid. p. 357). Horizontal equity refers to the belief that people in equal positions should be treated equally and people in different positions should be treated differently. However there are some definition issues in regards to defining equal positions, ability to pay approximated by income, wealth or expenditures are common definitions (ibid. p. 366). A difficulty when evaluating taxation on fairness grounds is which time framed that should be considered. The outcome of taxation might differ depending on if one values annual equity or lifetime equity (ibid. p. 481-482). It might be justified to apply a less efficient tax scheme on fairness grounds but it can be important to keep in mind that inefficient taxation, no matter how fair, might raise less total revenue and therefore create less social gains. Taxes have different purposes; some taxes are introduced solemnly to raise revenue, others to redistribute incomes or to even out living standards between groups and some to combat negative externalities. The reasons for taxation play an important role in determining the framework.

5.4. Ramsey rule

The Ramsey rule states that to minimize excess burden of taxation each commodity or service should be taxed so that the marginal excess burden on the last unit of currency of revenue is the same for each commodity (Rosen & Gayer, 2010. p. 353). This implies that commodities with highly elastic demand should be taxed lower than commodities with low demand price elasticity (ibid. p. 354-356). This way a combination of maximal revenue raised and minimal production distortion can be achieved. In other words policy makers should decide tax rates for commodities based on an inverse elasticity rule (ibid. p. 356-357). The Ramsey rule provides an interesting efficiency argument but is not widely used because of issues with fairness as well as difficulties in correctly estimating elasticities of consumers and suppliers.

5.5. Taxing Consumption

When introducing a tax on consumption there is excess burden in terms of distortions and reduced consumer and producer surplus. A consumption tax can either consist of an ad

valorem tax where the object of taxation is taxed with a rate by a specific proportion of its price or it can consist of a unit-tax (Rosen & Gayer, 2010. p. 310-312). An ad valorem tax has a negative income effect but no substitution effect (if introduced on a broad base) between goods other than leisure since they all face the same rate. A unit tax will usually incur both a negative income and substitution effect (ibid. p. 335-336). A broad-based single rate ad valorem tax is often referred to as neutral taxation, since different goods and services are taxed equally. When different rates are used for commodity taxation it will distort production. A tax on output in a particular sector will lower the relative price of the input that is widely used in that sector.

5.6. Consumption versus income taxation

There are some efficiency arguments for the use of consumption taxation over income taxation. One of the most important arguments is that a consumption tax is saving neutral whereas an income tax decreases savings since it taxes income from capital and therefore lowers the returns from saving (Rosen & Gayer, 2010. p. 478-479). A consumption tax is saving neutral in the sense that it taxes consumption with the same rate no matter when it takes place. An income tax on capital income however lessens the value of future consumption which creates disincentives for saving (Rosen & Gayer, 2010. p. 481-482). Savings are often seen as important for investment to be undertaken and increasing saving rates or at least not decreasing them might be an important objective for governments.

5.7. Distortion of trade and/or production

All forms of governmental inference that creates departures from the free efficient market equilibrium theoretically distort production and creates excess burden. This holds for efficient markets without externalities. Governmental policies, either taxation or subsidies, tend to change the equilibrium quantity to suboptimal levels. Either too little is produced or too much (Perloff, 2009. p. 289-290). When evaluating the introduction of a tax on a market, economists weigh the reduction in consumer and producer surplus against the tax revenue raised by the government. The consumer and producer surplus from trade are referred to as the welfare gains from trade. Usually the tax revenue raised is less than the welfare loss resulting in deadweight loss (Rosen & Gayer, 2010. p. 329). The DWL is computed by subtracting the tax revenue from the change in consumer and producer surplus in response to the tax. The magnitude of distortions or excess burden can be illustrated in a diagram by the size of the deadweight loss (DWL) area. An important objective when deciding on how to raise governmental revenue is trying to minimize the deadweight loss and changing the

quantity as little as possible from the free market equilibrium. This holds for efficient markets without externalities.

Because it is not possible to directly tax leisure any type of taxation will change the relative prices between consumption goods and leisure rather than just shifting the individuals' budget constraint inwards and therefore affecting the individuals choice of the ultimate combination of the two goods (Rosen & Gayer, 2010. p. 334-335). This will, for normal behaving preferences, lead to a substitution effect where the individual choose to work less hours than in absence of taxation. This holds both for direct and indirect forms of taxation.

5.8. Tax incidence

The economic incidence of consumption taxation is independent of whether the tax is levied on firms or directly to consumers (Rosen & Gayer, 2010. p. 302, 304, 309-310). It is generally the price elasticities of consumers and suppliers that will decide how the burden of taxation will be divided (Perloff, 2009. p. 59). In the extreme case of a perfectly elastic demand (facing a horizontal demand curve) and/ or a perfectly inelastic supply (facing a vertical supply curve) the whole tax incidence will be absorbed by the suppliers. In the extreme case of a perfectly inelastic demand (the demand curve is vertical) and/or a perfectly elastic supply curve consumers will bear the whole incidence. For all cases in between these extremes the burden of a consumption tax will be divided between consumers and suppliers. The tax incidence that fall on consumers can be calculated by:

$$\frac{\Delta p}{\Delta \tau} = \frac{\eta}{\eta - \varepsilon}, \text{ [Equation 1.5]}$$

Where η = Price elasticity of supply,

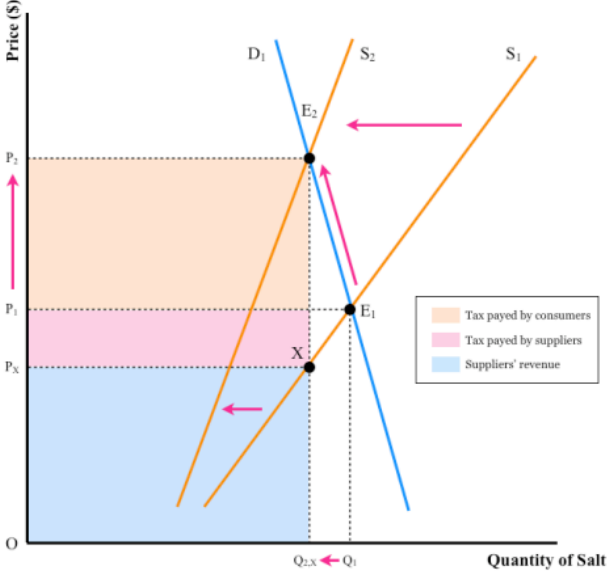
ε = Price elasticity of demand,

Δp = the change in consumer price

$\Delta \tau$ = the change in taxation

Since the price elasticity of demand is assumed to be negative it is clear that the larger the ε , in absolute terms, the larger the denominator will become making the fraction smaller, hence making the burden of the tax that falls on consumers smaller. In the same way a large η will increase the fraction by increasing the numerator indicating a larger share of the burden carried by consumers. This fraction is always a number between 0 and 1 for normal behaving

supply and demand curves since it represents a percentage.



Picture 2. Shows the new equilibrium and tax incidence in the case of an ad-valorem tax.

6. Empirics

6.1. How is the burden divided?

The actual tax incidence, defined as how the tax burden is divided between different groups, in a country is driven by different factors. Usually taxation systems are formed by compromising between economic efficiency and political values. Historic factors also seem to have an important role in determining the framework for what the public perceives as fair taxation. When it comes to consumption taxes the division of the burden will depend on whether consumption patterns differ between groups (SOU 2006:90. p. 333-343). Empirically it seems like those with higher income contribute the most in absolute terms although this seem to occur at diminishing levels.

As previously described in the theory section if efficiency can be maintained there need not to be a theoretical difference of whether compensation is implemented through a specific tax cut, an expenditure program or benefit payments (Rosen & Gayer, 2010. p. 397-398). The choice of implementation mean seem often seem to be chosen by rhetorical reasons. However empirically it has been shown that indirect mean tend to come at larger costs for the society making them less efficient in achieving certain objectives (SOU 2006:90. p. 114).

6.2. Previous research on price elasticities of food

In a study from 2010 Andreyeva et. al. tried to estimate the price elasticities of demand for different categories of food. They did so by creating 95 percent confidence intervals for the mean elasticities of each category by comparing at previously reported results from over 160 US studies. They found all food categories to have a relatively inelastic price elasticity of demand, which is in line with the general consensus and predictions based on elasticity theories (see section 5.2). All categories had price elasticities below 1, in absolute terms, but the elasticities varied significantly between different types of food (Andereyeva et. al. 2010. p. 218). Eggs, cheese and sweets had the lowest elasticities estimated at 0.27 and soft drinks and meals purchased away from home had the highest elasticities, up to 0.81 (ibid. p. 219). They found low income consumer to have higher price elasticities when narrowing down the food categories more specifically, likely due to the possibility of substitutes (ibid. p. 219). When looking at food in broader terms (with large categories including many types of food and/or groceries) elasticities did not differ much between income-groups and was estimated to be at 0.64 (ibid. p. 219).

6.3. The example of New Zealand

New Zealand introduced its current system of the GST in 1986 with a rate of 10 percent. They are one of the few countries that have a broad-based single rate with no reduced rates, however they do have a domestic zero rate on a limited number of services. Since the initial introduction the standard rate have been altered twice, firstly in 1989 from 10 to 12.5 percent and secondly in 2010 to 15 percent (Benge et al. 2013. p. 480-481). There have been a few studies carried out aiming to understand why it has been possible to achieve this kind of VAT design in New Zealand as well as evaluating how well it works. When the new VAT system, in New Zealand referred to as the Gross Sales Tax was introduced in 1986 compensation strategies were undertaken and especially low income families received subsidies and support to ease the transition (ibid. p. 490). Because of the administrative advantages of the GST there has been a trend in New Zealand to implement tax raises through GST and to implement tax cuts through the income tax (ibid. p 491). It should be mentioned that New Zealand has no threshold for income tax, unlike most countries, which means that income tax is paid for every dollar earned (ibid. p 492). This implies that it has been easier and more efficient to reduce income taxes to compensate for a more covering GST system. In countries where the threshold for introduction of income taxation is quite high, for example in Australia, increasing the coverage of the VAT base and while compensating through reduction in income taxation will be considered a much more regressive reform. Benge et al also concludes that because New Zealand's tax system was poorly designed prior to the GST system it might have been easier for policy makers to introduce such a drastic transformation (ibid. p. 496)

Two of the most interesting characteristics of New Zealand's VAT design are that neither food nor healthcare is exempt. Instead of compensating beneficiaries indirectly like most OECD countries compensations are implemented directly through different programs of subsidies and benefits. The VRR for New Zealand have been calculated to 0.98 (OECD, 2012. P. 111).

Table 1.1 Food consumption in New Zealand as a share of household expenditures

Year	2007	2010	2013
VAT rate in percentage	12.5	15	15
Food expenditures as percentage of total net expenditures	16.9	17.4	17.3

Source: Statistics New Zealand (2013) for food expenditures, Benge et. al (2013) for VAT rate.

The share of food as percentage of total household expenditure increased with 0.5 percentage points or 2.96 percent. In 2010 the government raised the standard VAT rate with 2.5 percentage points or 20.0 percent as previously mentioned. By looking at the table 1.1 it is clear that the change in food as a share of expenditure did not differ significantly comparing the short run and the long run. This indicates that perhaps changes in food consumption are mainly driven by other factors such as the general price change in the economy; inflation.

6.4. The example of Denmark

Denmark was the first out of the 30 OECD countries to implement a VAT system (OECD, 2012. p 68). In 1976 the standard rate was 15.0 percent, in 1980 it was increased to 22.0 percent and 1992 it was increased again to its current standard rate of 25 percent. Denmark was in 2009 the only member country in the European Union without any reduced rates; however they do apply a zero rate for some exempt goods and services. Denmark has been continuously more successful in receiving a higher VRR ratio than Sweden (OECD, 2012. p 113). This is to be expected considering that Denmark does not have any reduced rates. Slightly more surprising is that their VRR has been significantly higher than Sweden's even prior to the Swedish implementation of reduced rates. This could indicate higher levels of compliance which might be due to better organization of the administrative process, more resources spent on administering revenue collection and detection of tax evasion.

Table 1.2 Food consumption as a share of total expenditure 2007-2013

Year	2007-2009	2008-2010	2009-2011	2010-2012
Total expenditure DKK, annual average	292 187.6	274 257.4	285 044.2	282 894.2
Food expenditure DKK, annual average	28 387.4	27 149.9	27 913.1	28 155.7
Food as percentage of total expenditures	9.72	9.90	9.79	9.95

Source: Statistics Denmark (2013), Forbrugsundersøgelsen.

Food has remained stable accounting for just under 10 percent of total household expenditure for the average household. Note that the Danish consumers spend significantly less on food than the New Zealand consumers even though the VAT applied to food is 10 percentage points higher in Denmark than in New Zealand. This might imply that the domestic market

characteristics have a relatively large share in determining consumption development compared to changes in the VAT standard rate.

Table 1.3 Food consumption as an expenditure share for different household categories

Household category	Single households without dependent children	Single households with dependent children	Cohabiting couples without dependent children	Families with dependent children	Average all households
Food as a share of total expenditure, percent	13.1	15.2	13.9	14.1	13.9

Source: Statistics Denmark (2012), Denmark in figures 2012.

Table 1.3 shows the annual average food expenditure as a share of total expenditures for 2007-2009. The shares differ from the average levels in table 1.2; this is because food in table 1.3 also includes tobacco and beverages which are not included in table 1.2. By comparing the household average for 2007-2009 in table 1.2 and 1.3 it shows that by adding tobacco and beverages the share of expenditures increases with 4.18 percentage points.

6.5. Arguments for food to be exempt from VAT or taxed at reduced rate

Low-income earners are said to spend a larger proportion of their income on food than high-income earners. Therefore by reducing the VAT rate applied to food redistribution objectives can be achieved. This is the main argument brought up in the debate on why food should be exempt from the standard rate (OECD, 2012. p. 71-72). If we consider a cross-section of countries we can conclude that 23 of 29 OECD apply a reduced rate or a zero rate on food (ibid. p 80-83). The definition of what constitutes food varies between countries and over time.

6.6. Arguments against food to be exempt from VAT or taxed at reduced rate

One of the most commonly cited arguments against exempting food is that although low-income earners might spend a larger proportion of their income on food high-income earners generally spend a larger amount on food. This makes the indirect support to high-income earners larger in absolute terms than the support to low-income earners and is often costly for the government in terms of foregone revenue (OECD, 2012. p. 71-72). How costly the indirect support to groups other than the target group is often calculated by subtracting the support for the target beneficiaries from the total cost. In Sweden a governmental

investigation from 2006 estimated this cost to be roughly around 18 billion SEK per annum based on 2003 revenues (SOU 2006:60 p. 135), that figure is likely to have risen since the VAT for restaurant and catering services was reduced from the standard rate to 12 percent in 2012. Looking back through history in Sweden consumers in general, low-income as well as high-income earners spent a larger proportion of their income on food. There has been a steadily declining trend of the ratio of food expenditure as a share of total expenditure. Previously there have been relevant differences in the ratio of food expenditure between different groups but these differences have been declining during the last few decades (SOU 2006:90 p. 133-135). In a summary from SCB (2009) there is no general difference observed in the ratios spent on food by different groups. If the food expenditure ratio does not differ between groups reducing the VAT on food will not be an appropriate mean to reach redistribution objectives since it will equally benefit all groups (ibid. p. 132). This implies that keeping the reduced rate for food mainly functions as a general subsidy on food compared to that of other goods or as an industry support. Another argument against exempting food from the standard rate is difficulties of defining what constitutes food and welfare losses caused by product distortions (ibid. p. 56-57,67-68).

7. The Swedish case

7.1. Proposition for redesign

The proposition investigated in this paper is a revenue neutral redesign of the present VAT system. This means that the revenue raised by consumption taxes will remain the same and that the reform does not incur any large changes in administration costs. The suggested reform for the Swedish Government is to remove the reduced rates that are currently in praxis and to tax those goods and services with the standard rate. The extra revenue that would result from broadening the base for which the standard rate applies will be used to lower the standard rate to a level that makes the reform revenue neutral. The level of the new standard rate will be discussed and calculated below. Any further compensation suggested keeping the utility for all groups at least constant or higher than pre-levels are suggested to be financed by keeping the standard rate one or a few decimal percentage points higher than necessary.

In SOU 2006:90 it was estimated that 77 percent out of goods included in the VAT base were taxed with the standard rate, accounting for 88 percent of revenues. 18 percent of the total base was taxed with the reduced rate of 12 percent, accounting for 10 percent of revenues. 5 percent was taxed with the reduced rate of 6 percent, accounting for 1.5 percent of revenues. By using a FASIT micro simulation model the SOU 2006:90 estimated the revenue neutral standard VAT rate in absence of reduced rates to be 21.7 percent. This is 3.3 percentage points lower than the current standard rate. A reduction from 25 to 21.7 percent would be equal to a decrease in the standard rate with 13.2 percent.

Table 1.3 VAT base and payable VAT 2012 in billion SEK

VAT rate	25	12	6	Total
Turnover (base)	4387	657	154	5198
Payable VAT	1096.75	78.84	9.24	1184.83

Källa: SKV 152 utgåva 16, Skatter i Sverige 2013, p. 191

By assuming the base to be constant, which is obviously a large simplification; the theoretical standard rate in absence by reduced rates can be calculated by:

$$\frac{\text{Total payable VAT}}{\text{Total turnover}} = \frac{1184.83}{5198} = 0,22794 = 22,79\%, \quad [\text{Equation 2.1}]$$

This estimate is based on statistics of turnover and payable VAT reported to the Swedish Tax

Agency. This estimate is 1.09 percentage points higher than the estimate provided by SOU 2006:90 (p. 129) . There is likely to be two main reasons for this. The first reason is that in 2012 the VAT for restaurant and catering services decreased from the standard rate to the reduced rate of 12 percent leading to less total revenue, which therefore imply that a revenue neutral reform of the already lower 2012 level will differ from pre 2012 levels. Secondly the SOU based its estimates on consumption derived from the national accounts; this is the theoretical base if there is no tax evasion. The statistics used by the Swedish Tax Agency is based on current compliance levels and not on a theoretical 100 percent compliance and therefore narrowing the potential revenue base. The revenue used is based on actual reported revenue levels in both estimates which therefore incur differences in the theoretical standard rate.

Note that in the data used in table 1.3, collected and presented by the Swedish Tax Agency, payable VAT are differentiated after rate whereas receivable VAT is not. Therefore it is hard to estimate the exact rate that would raise the same net revenue as present system. On an aggregate level the allover receivable VAT should be the same or less, since most of the present base is subject to the standard rate. If payable VAT remains the same as with the present system and receivable VAT is less this indicates higher net revenue which would make the government better off. This revenue could either be used to pay for compensatory reforms to consumer groups that would loose from the reform or to further lower the standard rate beyond the 22.79% calculated in equation 2.1.

This current indirect cost (in foregone revenues) is rather large. It is difficult to estimate a real cost since estimates that assumes constant consumption ratios of the types of goods and services that are now subject to reduced rates are bias in the sense that they fail to reflect that agents alter their behavior in relation to a change in relative prices. Therefore an estimate that would assume that changing the standard rate to 22.79 percent or 21.7 percent would gain the exact same revenue is likely to overshoot or undershoot since the actual consumption is likely to change. However if the change in standard rate is modest and broadens the base this will remove some current product distortions and might be the best strategy based on information available. In the following sections calculations will be based on a VAT rate of 22.79 percent based on equation 2.1 even though it is a biased estimate and the government probably could lower the standard rate a few more decimal points of a percentage point while raising pre revenue levels.

7.2. Results

All figures of expenses and ratios are collected from HUT-2012, SCB 2. All prices are nominal in SEK. The information was gathered by a household survey sent out to 7500 households; the participation rate was roughly 38 percent. It is likely that some types of households participated more than others in relation to their population share and figures are therefore used more to illustrate an overview of some expenditure posts rather than as an exact estimate of consumption shares. Regarding the groups 'single households with dependent children' and 'families with dependent children' the average number of persons in each household has been used. It is possible that expenditure patterns differ depending on the number of dependent children which in that case might not be reflected in the average expenditure and income estimates. However simplifications have been made to increase comparability and to be able to better use different datasets since these are the general classifications that SCB have used for all computed data. Food expenditures do not include alcohol, tobacco or soft drinks.

Table 2.1 Expenditures of single households

Household category	Single households without dependent children	Average all households
Number of people	1.0	2.1
Average disposable income SEK	211 210	383 050
Average expenditures SEK	207 010	311 320
Expenditures as a percentage of income	98.01	81.27
Average food expenditures SEK	19 580	34 570
Food expenditure as a share, percentage points	09.46	11.10

Based on these figures from SCB it seems like single households spend less on food than the average household but more on housing. The costs for food in absolute terms as well as their share are lower than for single households with dependent children but on the other hand single households are less likely to be receiving government transfers.

Table 2.2 Expenditures of single households with children

Household category	Single households with dependent children	Average all households
Number of people	2.6	2.1
Average income SEK	302 970	383 050
Average expenditures SEK	277 260	311 320
Expenditures as a percentage of income	91.51	81.27
Average food expenditures SEK	33 740	34 570
Food expenditure as a share, percentage points	12.17	11.10

Single households with dependent children spend a larger proportion than on food than the average household. The average number of people in a household with dependent children is higher than for the average household but the disposable income is significantly lower. Single households with children are probably the category that receives the most transfers and benefits calculated per adult.

Table 2.3 Expenditures of cohabiting couples

Household category	Cohabiting couples without dependent children	Average all households
Number of people	2.0	2.1
Average income SEK	448 300	383 050
Average expenditures SEK	340 510	311 320
Expenditures as a percentage of income	75.96	81.27
Average food expenditures SEK	37 090	34 570
Food expenditure as a share, percentage points	10.89	11.10

Cohabiting couples are the financially strongest household category. Their expenditures as a share of disposable income is the lowest of all categories, implying either a higher saving rate,

larger shares of expenditures spent on things not included in the survey or both.

Table 2.4 Expenditures of families with children

Household category	Families with dependent children	Average all households
Number of people	3.8	2.1
Average income SEK	552 610	383 050
Average expenditures SEK	435 230	311 320
Expenditures as a percentage of income	78.76	81.27
Average food expenditures SEK	52 710	34 570
Food expenditure as a share, percentage points	12.11	11.10

Families with children are the household category with highest income and expenditure. They are the category that spends the most on food in absolute terms and together with single households with dependent children the in relative terms. Families with children often have two incomes and also receive some additional transfers regardless of income level.

7.3. Comparing Swedish food expenditure shares with Denmark and New Zealand

New Zealand has the highest expenditure share for food, both before and after increasing the standard rate. Denmark has the highest tax on food, 25 percent but still has the lowest expenditure share. Since Denmark and New Zealand only have a flat standard rate (in conjunction with the domestic zero rate) and have had so during their history of VAT it is not likely that the difference in food expenditure between Sweden and the two other countries illustrate a substitution towards food because of its lower rate. This is to be expected consulting economic theory of elasticities and tax incidence. Based on this it is slightly unlikely that the increase of 0.5 percentage points in food as a share of total expenditure in New Zealand 2010 was only due to the increase in the standard rate. Firstly because the standard rate increased for all goods and services included in the base, and therefore does not motivate a change in the shares of expenditure subject to the same tax rate pre and after the reform. Secondly because it seem like empirical evidence support the notion that it takes some time, perhaps years for the market to adjust to new equilibrium levels and stabilize, not a few

months. In Denmark the spread of food as an expenditure share is larger between different household categories than in Sweden. Perhaps implying that having a reduced rate VAT rate on food is a way to even out this spread.

7.4. Income elasticities of different goods

By using an econometrical simulation model for consumption, SOU 2006:90 divided consumption goods in to two categories, necessities and luxury goods (SOU 2006:90. p. 126).

As mentioned in the theoretical section goods can be classified differently by different consumers as well as differing for different income levels of the same consumer. At an aggregate level this classifications were made:

- Necessities: food, accommodation
- Necessities/luxury goods: Apparel, shoes, health care, domestic services, books, other leisure services
- Luxury goods: Restaurant services, hotel stays, alcohol, tobacco, furniture, inventories, transport

7.5. Elasticities for food

For food the income elasticity is believed to be quite low, perhaps even close to zero (Perloff, 2009. p. 51). This means that when income change consumers change their consumption in food by less (in percentage point) than the change in income. An evidence of this is the fact that looking at the last few decades even though income levels have steadily risen food as a share of expenditures have steadily decreased (SOU 2006:90. p. 91). According to the Ramsey rule of taxing goods where the elasticities of consumers are low (and therefore leads to small reductions in quantity) it is not efficient to tax food lower than other goods. If anything food should be taxed higher compared to other goods. Food as a category is also likely to have relatively low price elasticity since there are few substitutes. However the cross-price elasticities between different subgroups of food are likely to be very high. Previous empirical work estimated the price elasticities to be inelastic but not zero. Since the VAT apply to all food and since food and restaurant services are taxed equally both in the present system and in the suggested new system relative prices amongst subcategories within food goods and services need not to change significantly. However since cross-price elasticities vary between different types of food and so do the price elasticities of demand, it is therefore likely that price effects due to the reform will differ significantly between different types of food but on the aggregate level prices are estimated to rise but probably not with the

full tax increase.

Because lack of estimates of the price elasticity of supply it is hard to predict the consumer outcome from increased food prices. However by making the simplifying assumptions that the tax would increase with the full amount, keeping income constant and assuming no substitution; we can compute how much the standard rate would have to decrease to keep the expenditure share of food equal.

7.6. Effect of a change for different groups

In table 3.1 the effect of the reduced standard rate of 22.79 percent applied on food expenditures has been calculated based on data from table 2.1-2.4. For each group the theoretical increase in food expenditure in the case of a 100 percent consumer tax incidence is computed. This implies assuming either $\eta \rightarrow \infty$ or $\varepsilon = 0$ so that $\eta/(\eta - \varepsilon) = 1$. This implies a horizontal supply or vertical demand curve which would be extreme cases, the real effect is therefore likely to be more modest than implied in table 3.1. Because table 3.1 illustrates important changes of a significant household expenditure post I have decided to include it even though its upward bias.

Table 3.1 Cost calculations for a 100 percent consumer tax incidence of food

Household category	Cost 2012 prices SEK 12% VAT	Cost 2012 prices SEK 22.79% VAT	Food as expenditure share at 12% VAT	Food as expenditure share at 22.79% VAT
Single households	19 580	21 466	9.46	10.37
Single households with dependent children	33 740	36 990	12.17	13.34
Cohabiting couples	37 090	40 663	10.89	11.94
Families with dependent children	52 710	57 788	12.11	13.28
Average all households	34 570	37 900	11.10	12.17

Source: Expenditures for 2012, Statistics Sweden, calculations by this papers author based on theses figures. See Appendix 1.

In reality it is most likely that there will be substitution effect which implies that all household categories that substitute food towards goods that are now relatively cheaper will be better off than implied by table 3.1 and will need less compensation than estimated.

7.7. General effects for all groups

7.7.1. General Price decline of goods and services included in the VAT base

Prices of most goods and services should decline. Whether the price of a good or a service will decline will the full amount of the tax cut is doubtful and subject to market characteristics. In SOU 2006:90 estimates predicted that the price effect of decreasing or increasing the VAT for food should be close to a 100 percent in the long run but could under- or overshoot. The price effect of the 2012 decrease of VAT for restaurant services have been ambiguous at best, in most cases close to non-existent, in this case it seems like the tax cut has been absorbed as an industry support increasing profits rather than lowering prices to consumers. Since prices on all goods (except for those that were prior subject to reduced rates) should decrease this would manifest a positive income effect. The increase in the relative prices of goods that have been previously exempt should theoretically lead to a substitution effect where consumers decrease their consumption of those goods in favor for other goods. On the other hand a number of the previously reduced goods can be seen as necessary goods implying an income elasticity of less than 1. This could imply that the decrease in demand for goods that were previously subject to reduced rates will be less than what economic estimates would indicate.

For markets characterized by perfect competition or close to perfect competition there are no profits in the long run. The demand curve that each firm faces is horizontal at the market price meaning that all firms will be price takers choosing to produce up to the point where marginal revenue equals the marginal cost. In these types of markets the reduction of the standard rates should lead to a price reduction with the full amount (at least in the long run).

For markets characterize by imperfect competition, oligopoly or monopoly it will again depend up on elasticities and will generally be a question of empirics. The prices for restaurant meals has not decreased significantly since the reform in 2012, implying that the tax revenue reduction instead was soaked up as an industry support rather than lower consumer prices. According to Perloff it is not only the elasticities that factor in how prices are effected by changes in ad valorem taxes but also how aware consumers are of the

proportion of the price that consists of tax compared to the good (Perloff, 2009. p. 104-105). In Sweden firms conducting b2c business mainly display the consumer price that is inclusive of VAT. Many consumers are therefore not aware of the actual price that firms charge for a purchase, i.e. exclusive of VAT, even though that price is always specified on the receipt or invoice.

In general by using equation 1.5 presented in the theory section for determining the tax incidence that fall on consumers and rearranging it we get a general equation for the change in the consumer price.

$$\frac{\Delta p}{\Delta \tau} = \frac{\eta}{(\eta - \varepsilon)} \rightarrow \Delta p = \Delta \tau \frac{\eta}{(\eta - \varepsilon)}, \text{ [Equation 2.2]}$$

7.7.2. Possible price decline for goods and services currently exempt from the VAT base

Firms that provide goods and services that are exempt from the VAT base might still use inputs that are subject to VAT taxation. Since businesses providing services or goods exempt from the VAT base are unable to recover VAT costs on their inputs cascading effects take place (The Swedish Tax Agency, 2013. p. 187). This cost increase will generally be passed on to consumers in terms of higher prices. It is therefore likely that a reduction of the standard rate will decrease input costs for also for businesses that are currently exempt from the VAT base. One example of this is the rental real-estate market which expectedly would incur lower costs resulting in decreased housing fees (SOU 2006:90. p. 117). Single households, low-income earners, students and low income retirees are more likely to live in a rental unit or to own a unit and also tend to spend a larger proportion of their expenditures on housing. These groups would therefore particularly benefit from any reductions in housing costs.

7.8. Suggestions of compensatory reforms

7.8.1. Who should be compensated?

In the transitional phase between changes of taxation systems there are often winners and losers, in the text above attempts to outline how this reform would affect different groups have been made. How should the gains and losses in utility be compared to compensate the losers of the reform but without further subsidizing groups that are already net beneficiaries? One way would be to estimate how much consumption in absolute terms, assuming the average marginal propensity to consume, would need to increase as a result of lower general prices to combat the higher prices of those goods that were previously subject to reduced rates. This could be achieved using average total consumption for different groups, but to be

able to achieve a somewhat accurate estimate further information need to be gathered.

7.8.2. Increased student benefits

Students stand out as a group that, relatively other groups have quite small financial marginal. Students spend a large share on food and also spend a relatively large share on cultural consumption in terms of course literature. Students are less likely to own a car because of their limited means and use public transport more frequently than the average consumer. Because course literature and food are likely to be defined as necessary goods for students their price elasticity is likely to be less than one. This means that the substitution effect will be less than for normal goods. Since students are a group with a particularly low income level their general consumption after food, housing and literature costs are paid are likely to be low both in absolute terms as well as its share of income. This implies that increased utility from the positive income effect resulting from a lower standard rate might not be enough to counteract the negative income effect from higher prices for food, course literature and public transport. If student benefits were increased it could compensate students leaving them as well off as prior to the reform if not better while incurring a relatively small cost for the society in comparison for the cost of foregone revenues and production and consumption distortions of the present system.

In SOU 2006:90 Uppsala Studentkår (Uppsala University Student Council) calculated the monthly increase from removing the reduced rates and decreasing the standard rate to 250 SEK per student (SOU 2006:90 p. 58). If the Swedish government were to increase the monthly student benefit with 250 SEK per student this would increase costs with circa 995 million SEK per year, see Appendix 2 for calculations and data (*2012/13:1 UTGIFTSOMRÅDE 15*, p. 19). This would amount to a cost increase of 15.624 percent of the current student benefit costs which in turn amounts to circa 0.299 percent of total VAT revenues; again see Appendix 2 for calculations.

7.8.3. Subsidies to public transport

Empirics show that people with lower incomes are less likely to own a car than those of average or above average income levels. In Sweden, like many other countries, there is a specific tax on fuel to reduce consumption levels and combat negative externalities as well as raise government revenues. In conjunction with the reduced rate on public transport this has made the relative price for public transport in terms of car travel cheaper than it would have been in absence of the reduced rate and the Pigout-tax. The reform removing the reduced rates does not affect the Pigout-tax on fuel which would still be effective; however it does change

the relative prices between travel by public transport and car travel. To even out bias between alternatives would normally be considered a positive move in economic terms since it increases efficiency and moves towards market equilibrium. To compensate low income earners that travel a lot by public transport the government could offer some cost relief. Rather than doing this through subsidies to public transport firms I would suggest increased deductibility for public transport on low income earners personal income tax. That way the transport firms does not loose incentives to be cost minimizing and the government does not have to offer the subsidy to others than the target beneficiaries.

7.8.4. Increased means to libraries

Another way of compensating students and low income groups from the increased relative prices of cultural consumption would be to increase means to public libraries as well as school or university libraries.

8. Discussion

As should become quite clear through the readings of this paper is that there seem to be quite a lot of consensus on the perks of having a comprehensive base in addition to a single rate.

Despite this we can see that a trend in several OECD countries where additional exemptions from the base are implemented as well as reduced rates. This brings us to an important question – what weight should be placed on economic efficiency when deciding on means for collecting government revenues? This is an age old trade-off between efficiency and fairness that policy makers face and struggle with. Nor is it made easier by politicians sometimes letting self-interest about winning time in office affect policies as well as rhetorical reasons to gain popularity in certain voting segments.

Another issue with many types of political reforms seem to be that voters and policymakers often are just as concerned, if not more, about absolute and relative gains to different beneficiaries rather than looking at the all over effect between implementing a policy change or not. In general those that have high levels of consumption will benefit more than those that have low levels which some criticize of fairness grounds. However the increased benefits to large consumers are not incurred by disutility of those that consume less therefore it is a slightly less relevant argument. The only way that the reform would be paid for in total by low income earners would be if they only consumed goods subject to the reduced rates and no goods subject to the standard rate in conjunction with high income earners only consuming goods subject to the standard rate and no goods subject to reduced rates. In section ... we can see that the share spent on food does not differ largely between groups therefore proving this logic invalid. It is however true that the absolute support, as previously stated, is largest to those that consume most.

As mentioned in the delimitations any dynamical effects in the aggregate economy will not be further discussed. Based on the empirical material that I have assessed during the work with this paper in conjunction with theory of income elasticities, price elasticities and efficient conjunction I believe that the welfare loss due to the decrease in consumption of those goods that were previously taxed with the reduced rates will be offset by the welfare gains of the increased consumption of goods previously taxed at the 25 percent standard rate. Where in the economy that possible growth would occur and production increases or decreases be made is hard to know. Once again knowledge of income elasticities as well as price elasticities of firms are needed. It is also of importance whether firms and consumers believe in

policymakers and thinks that the new VAT system will last. According to the consumption smoothing hypothesis consumers will increase their consumption as a response to an increase in income in the present time period as well as the future if they believe this increase to be permanent. If the increase is not believed to remain consumers will save and spread the benefits over both time periods by increasing present consumption less than the income elasticity would conclude.

9. Suggestions for further research

It seems as a reduction of the general standard rate would increase consumption of many goods. Fuel would get cheaper whereas prices for travels by public transport would increase. This would alter the relative prices between traveling by car versus public transport. One increasingly important political issue to tackle is that of sustainable development. From a sustainability perspective increased consumption and a substitution effect from public transport to car travel might not be positive. Therefore I think it would be interesting for future studies to look at whether the tax on fuel should be increased or whether public transport should be further subsidized if the two reduced VAT rates are removed to be able to reach the sustainability objectives that have been set out.

Focus in this paper has been on the theoretical implications of reduced rates, predictions how a removal of the reduced rates would affect different groups as well as on the issue of applying a reduced rate for food as a mean to reach redistribution objectives. Because of time limitations no further analysis on the long term consequences for the cultural sector have been undertaken. It would be of interest to investigate how a higher rate of VAT in some cultural areas will affect quantity of consumption as well as the diversity.

10. Conclusion

My conclusion is that a removal of the reduced rate and a reduction of the standard rate could lead to a Pareto improvement for consumers. All consumers will not gain equally from such a reform but the negative effects from price increases due to goods that were previously subject to a reduced rate are for most groups offset by a reduction in prices due to a lower standard rate. It is hard to predict exactly how much consumers will gain since it depends firstly on how prices change, something that will differ between markets, and secondly on how consumers substitute different goods as well as on their perception of the reform to be permanent. The groups that would receive a lower utility level from the reform are mainly those with very low incomes, single households with dependent children, students and low income single retirees. These groups could be compensated to maintain previous utility level either through increased direct transfers or by increasing subsidies to services that make up a significant cost for these groups such as housing or public transport.

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12. Appendix 1

Calculations for food expenditure ratios. The expenditure data of total expenditure and food expenditure are gathered from SCB 2, Hushållens utgifter (HUT) 2012. All ratios, food prices exclusive VAT and food price inclusive 22.79 % VAT with 100 consumer tax incidence have been calculated by the author of this paper in Excel.

Food expenditure as a share of total expenditure: $\frac{\text{Food expenditures}}{\text{Total expenditures}}$

Food expenditure in percentage points: $\frac{\text{Food expenditures}}{\text{Total expenditures}} * 100$

Food expenditure excluding VAT: $\frac{\text{Food expenditures}}{1.12}$

Food expenditure including 22.79 % VAT with 100 percent consumer tax incidence:

$$\frac{\text{Food expenditures}}{1.12} * 1.2279$$

Household category	Single, no children	single with children	couples, no children	families	average all households
total expenditures	207 010	277 260	340 510	435 230	311 320
food expenditures incl 12 % VAT	19 580	33 740	37 090	52 710	34 570
food 12% VAT/expenditures	0,094584803	0,121690832	0,108924848	0,121108379	0,111043299
food expenditure in % points	9,458480267	12,16908317	10,8924848	12,11083795	11,10432995
food exp excl VAT	17482,14286	30125	33116,07143	47062,5	30866,07143
food exp incl 22.79 % VAT	21466,32321	36990,4875	40663,22411	57788,04375	37900,44911
food 22.79% VAT/expenditures	0,103697035	0,13341444	0,11941859	0,132775874	0,121741132
food expenditure in % points	10,3697035	13,34144395	11,94185901	13,27758743	12,17411317
Difference in percentage points	0,911223233	1,17236078	1,049374205	1,166749477	1,069783216

13. Appendix 2

Cost calculations for increased student benefits.

Cost calculations are based on figures for 2011 (*2012/13:1 UTGIFTSOMRÅDE 15*, p. 19).

Number of students attending post high-school education: 331 700

Paid student support (million SEK) : 6 369

Uppsala Studentkår suggested that an increase of 250 SEK per student and month would be needed to keep students' utility constant to current levels (SOU 2006:90 p. 58). Because of inflation this amount should probably be higher but since all students do not study full time or receive full time support the cost will be overestimated and therefore have room to adjust for inflation.

The cost, in million SEK, for increasing the student benefit with 250 SEK per month is calculated by:

$$\frac{331\,700 * 12 * 250}{1\,000\,000} = 995.1$$

This gives a new total cost of $995,1 + 6\,369 = 7\,364.1$ which is an increase with 15.6241 percent. Given by:

$$\frac{(7364.1-6369)}{6369} = 0.156241$$

The cost of increasing student benefits in relation to total VAT revenues is calculated by:

VAT revenue 2011, million SEK (SCB 1, 2014): 332 500

Cost of student benefit increase: 995.1

$$\frac{995.1}{332\,500} = 0.002992782 \text{ in percentage this is equal to } 0.2992782 \text{ percentage points.}$$