Do the Scandinavian consumers pay a 'fair' price for premium German white wines?

Bezahlen die skandinavischen Verbraucher einen "fairen" Preis für hochwertige Weißweine aus Deutschland?

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Abstract

The aim of this paper is to analyse the retail prices of premium German white wines sold in the Scandinavian countries. German white wines account for approximately 5-6 per cent of the total sale of wines – both red and white wines - in Denmark, Norway and Sweden. However, the market shares of German wines in Scandinavia have been declining for a number of years. Diminishing market shares may reflect changes in consumer taste or simply 'wrong' prices, the latter related to both the level of wine prices (German wines being relatively expensive) and the structure of wine prices. In general, country-specific price differences for identical wines may be caused by differences in taxes, different import prices, transportation costs as well as other costs - and also different competitive conditions at the retail level in the respective countries. Still, differences in wine prices across countries do not always reflect the above mentioned factors. The aim of this paper is to analyse further the relationship between the prices of German white wines in the Scandinavian countries and the prices in the country of production (Germany) by direct comparison (price level) and by using a hedonic price function approach (price structure). Using a sample of 150 German white wines being supplied on at least one of the national markets in Scandinavia the analyses suggest that the prices on German premium white wines on the Scandinavian markets are fair – both in terms of absolute average prices and in terms of relative prices.

Key words

German white wine; Scandinavian wine markets; hedonic prices

Zusammenfassung

Das Ziel dieses Aufsatzes ist die Analyse der Verbraucherpreise von hochwertigen deutschen Weißweinen in den skandinavischen Ländern. Der Marktanteil von deutschen Weißweinen am Gesamtumsatz von Rot- und Weißwein in Dänemark, Norwegen und Schweden beträgt um die 5 bis 6 Prozent, allerdings mit einer fallenden Tendenz in den letzten Jahren. Die Ursache von abnehmenden Marktanteilen können zum einen Veränderung in den Verbraucherpräferenzen sein oder zum anderen ganz einfach „falsche" Preise, wobei letztere Problematik sowohl vom grundlegende Preisniveau, also deutscher Wein wurde relativ teurer, als auch von der Preisstruktur des Weinmarktes herrühren kann. Im Allgemeinen werden länderspezifische Preisunterschiede für identische Weine durch Differenzen in den Besteuerungssystemen, den Einfuhrpreisen, Transportkosten oder anderen Kosten erklärt, jedoch sind Preisunterschiede zwischen Ländern nicht ausschließlich durch diese Parameter bestimmt. Die vorliegende Arbeit untersucht das Verhältnis zwischen den Verbraucherpreisen für deutsche Weißweine in Skandinavien und den Preisen im Herstellungsland durch den Direktvergleich, also eine Analyse des Preisniveaus, und durch die Schätzung einer „Hedonic"-Preisfunktion, also eine Analyse der Preisstruktur. Basierend auf Preisdaten über 150 verschiedene deutsche Weißweine, die jeweils zumindest auf einem der drei skandinavischen Märkten vertrieben werden, wird gezeigt, dass die Verbraucherpreise von hochwertigen deutschen Weißweinen in Skandinavien als „fair" anzusehen sind, sowohl im Bezug auf den absoluten Preisdurchschnitt, als auch im Bezug auf den relativen Preis.

Schlüsselwörter

deutsche Weißweine; skandinavische Weinmärkte; hedonische Preise

1. Introduction

There has been a long tradition for drinking German white wines in the Scandinavian countries. One explanation is the closeness of the nordic countries to Germany. Germany was and is the most important trade partner to e.g. Denmark and

in the post-war era - especially in the 1960s and 1970s where transportation and information costs played a more important part than today - German wines had a significant position on the Danish market. However, real income growth and the escalation of tourism, i.e. Scandinavians going for holidays in the southern European countries, changed the drinking habits in several ways. The demand for wine increased in general and red wine became relatively popular and accordingly the demand switched from white to red wine. This resulted in weaker market conditions for German white wines on the Scandinavian markets. Within the last two decades German white wines faced even more challenges on the Scandinavian markets because other white wines were gaining momentum, first from France and later from overseas wine countries like Australia, California and Chile. Consequently, the Scandinavian market could not be considered as a growth marked for German producers – at least for the period that passed.

This paper deals with prices for premium German white wines on the Scandinavian markets. It analyses prices for wines sold in Denmark, Norway and Sweden vis-a-vis prices for exact the same wines in Germany. The title of the paper raises the question whether German wine prices are *'fair'* on the Scandinavian market and answering this question involves both analysis of the *level of wine prices* and analysis of the *logic of relative prices* on each market. Thus, fairness is measured by average price differences as well as the logic and consistency of relative prices within and between the countries, see below. Competition on the European markets should in principle lead to harmonised price structures of commodities, i.e. German wines on the various Scandinavian markets. Still, it is a well-known fact that there are cross-country differences in goods prices where, of course, differences in duties and other taxes among countries must result in such variations, but attention must also be paid to real differences in the competitive conditions in each country, i.e. supply and demand conditions. If market power exists, producers may exploit different market conditions and within the framework of the competition laws producers charge different prices at different market segments. I.e. on geographically distant markets some price variation is expected simply because of information and transparency problems. Next to taxes and lack of information, variations in e.g. import prices and distribution costs are highly important factors for price variations.

The methodology of this paper is using wine prices as announced by the German producers and the market prices before and after tax on the markets in the consuming countries. The German prices are assumed to reflect the basic quality of the wines and consequently to a large extent they indicate the correct price level and price structure. Comparing these prices with retail prices for identical wines in the consuming countries it is analysed whether excess prices are paid in the consuming countries.

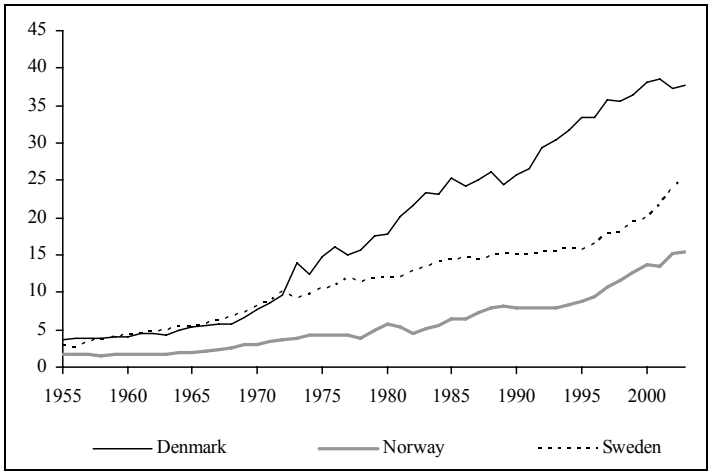
The second dimension of 'fair' prices – namely the logic of the relative prices – is addressed by setting up a hedonic pricing model on each market in order to test whether suitable explanatory variables really can explain prices. This part of the paper focuses on the individual quality of the wine, i.e. expert ratings, the legally required quality categories, the reputation of the producers, the reputation of the wine region, the size of the producers and other factors, see below. If the basic factors perform well in explaining, prices can be considered fair in that respect.

The following section gives a brief overview of the Scandinavian wine markets and reviews trends in wine consumption with focus on the market position of German white wines in Scandinavia. In section 3 an empirical price model is developed in order to analyse the logic of the price structure. The following section includes cross-country price comparisons in pairs of identical German white wines. Market prices and pre-tax prices are compared and there is some evidence that the producers seem to bear part of the wine tax burden on the Scandinavian markets, i.e. the general price level on German white wines is fair for the consumers. Section 5 presents the results of the hedonic pricing model and it turns out that these models explain prices rather well in all countries. Thus, there seems to be 'fair' prices on German white wines in terms of the relative prices on the Scandinavian markets. Section 6 concludes.

2. Trends in the Scandinavian wine markets

None of the Scandinavian countries have long and great traditions for drinking wine. This is illustrated in figure 1 showing that until the late 1960s the wine consumption was very modest. However, the Danish membership of the EC in 1972 lowered the taxes on alcohol (especially wine) significantly in the early 1970s[1] and consequently, the consumption of wine increased in Denmark as can be seen from figure 1. Furthermore, the closeness of Denmark to Germany and continental Europe in general led to adjustment of the Danish alcohol policy to e.g. German standards (except for the taxes on strong alcoholic beverages). On the other hand, Sweden and Norway were not EU members and therefore their quite restrictive alcohol policies could be sustained.

Figure 1. Wine consumption in Denmark, Norway and Sweden, 1955-2003 (litres per capita, 15 years+)



Sources: STATISTICAL YEARBOOKS for the relevant countries; ALKOHOLSTATISTIK 1999 (Alkoholinspektionen 2000, Sweden); NORDIC ALCOHOL STATISTICS 1993-2003 (Stakes, Finland 2004)

[1] See BENTZEN and SMITH (2003) for a detailed description of the Scandinavian tax and alcohol sales system.

After Sweden joined the EU in the 1990s the wine consumption developed as earlier in Denmark. Thus, Sweden appears to have entered trajectories of strongly increasing wine consumption levels – even though Sweden still has a rather restrictive alcohol policy compared to Denmark. Note that Norway – still being able to pursue an even more restrictive alcohol policy – is lagging notably behind both Denmark and Sweden even today with a yearly wine consumption level around only 14 litres per capita, 15years+.[2]

Of course the overall development in sales of wine depends on demand and supply conditions. While Denmark as well as Germany has a liberal, market-oriented system for sales of alcoholic beverages the system is quite different in Norway and Sweden. In Norway sales (except for light beer) take place though the state monopoly 'Vinmonopolet'. Originally there was monopoly at both the retail and wholesale level but by now 'Vinmonopolet' is only a retail sales monopoly. In total, there were approximately 200 shops in 2004, meaning that the density of shops is quite low – 4 shops per 100 000 inhabitants (alternatively 1 shop per 1 900 km^2 ground area). The low density of alcohol stores combined with the geographical conditions explain the relatively low wine consumption in Norway.

The Swedish retail system is quite similar to the Norwegian system. The retail sales of spirits, wine and strong beer are organized by the state-owned monopoly 'Systembolaget'. Earlier there was an effective monopoly in the entire distribution chain but after Sweden joined the EU in 1995 private import companies may sell wines directly to 'Systembolaget', restaurants, hotels etc. More than 200 companies are licensed to import wine. It had approximately 420 shops in 2004 and local agents in 580 communities. This amounts to 5 shops per 100 000 inhabitants or alternatively 1 shop per 1 100 km^2 ground area.

Looking deeper into the Scandinavian wine market table 1 demonstrates the relative importance of white wines and in particular German white wines in 2000 and 2004. The overall market share of white wines is quite stable in each country. Around 1/4 of the total wine consumption in Denmark is consumption of white wine, whereas nearly 1/3 of the wines sold in Sweden are white. In Norway the market share of white wines is around only 21-22%.

Even though the consumption of white wines seems stable, the German position on the Scandinavian markets has changed notably. Still looking at the 5-year period in table 1, the market share in Denmark fell from 25% to 18%. Furthermore, within this period the absolute consumption level decreased from 11 to 8.5 million litres. The same thing occurred in Sweden leaving a market share of only 15% among the white wines to the German wines. Finally, it is easily seen that the trend is the same in Norway – though the overall market share of German wines is higher there.

Summing up, table 1 clearly shows that German white wines are exposed to severe pressure on the Scandinavian wine markets, and there are several explanations. First of all, over the last decade a huge variety of wines (including white wines) from overseas countries have been introduced to the Scandinavian markets. In the upper end of the market segment, especially wines from Australia, New Zealand and California dominate, but also wines from France have a strong position, especially in Norway. Within the mid- and low-priced market segment, wines from Chile, Spain, Italy and Hungary (in Norway) are frequent.

Table 1. Annual sales of wines, white wines and German white wines, Scandinavian countries (million litres)

	Denmark		Norway		Sweden	
	2000	2004	2000	2004	2001	2004
Total sales of wine	174.4	195.9	41.9	50.1	124.2	138.7
White wines	45.1	48.1	9.0	11.5	40.1	44.5
German white wines	11.1	8.5	3.5	3.7	8.2	6.5
Market share of German white wines, per cent:	25	18	39	32	20	15

Notes: For Denmark, the numbers refer to the total gross import of wines, where a considerable part is re-exported. For Norway and Sweden, the data cover the sales from the state monopolies and do not include all sales of wines. The data from SYSTEMBOLAGET (Sweden) concerning Germany refer to the total sales of German wines which are assumed to be only white wines (no German red wines are presently offered for sale at SYSTEMBOLAGET).

Sources: VSOD (Denmark), VINMONOPOLET (Norway), SYSTEMBOLAGET (Sweden)

3. Prices – an empirical model

Basically, the retail prices on German wines on the Scandinavian markets reflect the following factors:

- Producer price (which depends on e.g. quality, reputation etc.)
- Transport and insurance costs
- Payment to wine merchants
- Import tariffs for overseas wines entering the EU
- Expenses and profits at the wholesale level
- Wine duties
- Distribution costs
- Costs and profits at the retail level
- Sales tax, VAT.

Assuming that the supply price of the German producers is the same for all Scandinavian buyers, price variations must then reflect differences in one or several of the other cost components. An additional potential factor explaining price variations is price discrimination. Demand elasticities vary across countries and producers may exploit this and hence, differences in prices of identical wines may occur. Furthermore, tax differences in the consuming countries may also result in different buying prices, i.e. the producers bear part of the tax-burden.

[2] Normally, the increases in wine consumption are also explained by the rising living standards due to the significant real income growth in Scandinavia, trade liberalisation and especially growth in nordic charter tourism to southern Europe where wine is also abundantly and cheaply available. As no wine production was taking place at home, consumer preferences or habits for wine were adopted from outside.

Wine prices in Scandinavia are expected to be lowest in Denmark because of competitive conditions at all levels in the national distribution chain. Furthermore, taxes on wine are significantly lower in Denmark as compared to Norway and Sweden, see table 2, and general taxes in the Scandinavian countries are cost factors which potentially increase prices compared to Germany. Note that taxes in the Scandinavian countries are scaled progressively according to the alcohol content. The last column in the table presents comparable taxes in EURO per litre wine.

Table 2. Wine taxes in the Scandinavian countries and Germany, 2004

	Tax in national currency; per litre (alcohol content in per cent)	General taxes (VAT)	Wine tax (12% alcohol) EURO per litre
Denmark; DKK	7.05 (6-15%)	25%	0.95
Norway; NOK	3.61 per % volume per litre (<22%)	24%	5.35
Sweden; SEK	22.08 (8.5-15%)	25%	2.40
Germany	-	16%	-

Notes: exchange rates as of May 2005

Source: national tax authorities

Comparing the tax level with Germany, all the Scandinavian countries have significantly higher wine taxes, especially when the VAT is taken into account. In 2004, VAT in Denmark, Norway and Sweden was 25%, 24% and 25%, respectively, but in Germany it was only 16% on wine. Judged solely from the tax rates shown in table 2, Norway is expected to have the highest prices for wine, followed by Sweden, Denmark and Germany.

Systembolaget and *Vinmonopolet* are large buyers on the wine market because of the state monopoly which until recently covered the import/wholesale level, too. Consequently, their bargaining position against especially small suppliers of German wine is stronger than the position of e.g. a small Danish importer. The demand for German wines in Denmark and Sweden is relatively higher than in Norway, suggesting that buyers from the two former countries may gain some discount compared to Norwegian buyers when negotiating with German wine producers.

It should be noted that sales prices in each of the Scandinavian countries are set according to the overall alcohol (and fiscal) policy of the countries, whereas the Danish prices result from competition giving generally lower prices and most likely a price structure more in line with the suggested price structure of the producers themselves. Thus, it is expected that wines sold in Denmark are cheapest within the Scandinavian countries and more in line with prices in Germany.

In line with a number of other studies, we estimate a hedonic price function, see ROSEN (1974) for the theoretical underpinning. The basic idea of hedonic price function is that consumers pay attention to all relevant product attributes in their buying decision. Consequently, the buying price reflects all the characteristics included in the good. Still there may be an identification problem, i.e. the prices are not necessarily equilibrium prices reflecting the embodied attributes of the good because they potentially reflect both demand and supply factors. According to ARGUEA and HSIAO (1993) the identification problem is basically a data problem, which can be solved by using panel data. In line with the majority of other studies equilibrium prices are assumed meaning that the hedonic price function approach can be applied without further attention to supply factors.

Noting that the consumers' subjective valuation of the wine cannot be measured, a set of indicators representing the attributes of the wine is included in the model as explanatory factors, see e.g. SCHAMEL (2000, 2003), COMBRIS et al. (1997), LANDON and SMITH (1998), OCZKOWSKI (2001) and SCHAMEL and ANDERSON (2003). SCHAMEL (2000) finds that the general reputation of the region and the individual quality indicator of the wine (awards) is important in explaining the price of Californian red wines. Using a similar approach for Australian wines and wines coming from New Zealand SCHAMEL and ANDERSON (2003) also find that the reputation of the region, sensory quality rating of the wine and the rating of the producers are all important factors behind prices. LANDON and SMITH (1998) find that regional reputation indicators have an important influence on prices of Bordeaux wines, whereas short term quality improvements seem less important. SCHAMEL (2003) crafts a hedonic price model for German wines. The main findings are that, sensory quality ratings, the German compulsory system (by law), where producers must declare a precise quality category (by the degree of ripeness of the grapes at harvest), the sweetness of the wine and region where the wine comes from are all important factors for the price.

The model in the present analysis includes indicators for regional reputation and producer's reputation and also quality indicators for the individual wines. Furthermore, information on the quality level by German law and information on the variety is included.

Thus, *the indicator of regional reputation* is measured by the region of production, i.e. Mosel, Rheinhessen, Rheinpfalz and Rheingau, Baden and Franken and finally Saar-Ruwer, each area having its particular reputation. In the Scandinavian countries, wines from Mosel and Rhein are well-known and have traditionally been the major 'brands'. In Germany, wines from Baden and Franken hold a relatively stronger position as compared to the Scandinavian markets. Finally, the regional reputation of wines coming from the Saar-Ruwer area is expected to be the weakest one, because this area is not well known in e.g. Scandinavia.

An *indicator for the producer's reputation* is also included because a good reputation is expected to lead to higher prices. Thus, sensory ratings from *Gault Millau 'Weinguide für Deutschland'* have been used, see table 3. In this rating, producers are classified according to their historical record concerning the annual quality of wines coming from the Weingut.

Gault Millau operates with five categories: 5: Among World's best producers, 4: Excellent producers belonging to the best in Germany. 3. Very good producers, who constantly produce high quality wine. 2. Good producers, producing wines, which are above standard quality. 1. Reliable producers, producing wines with a basic quality. In the empirical analyses presented below, these five categories are used to make two dummy variables: One for the best

Table 3. Classification of producers according to Gault Millau Weinguide

Category	Characteristics	
*****	Among World's best producers.	Höchstnote für die weltbesten Weinerzeuger
****	Excellent producers belonging to the best in Germany.	Exzellente Betriebe, die zu den besten Weinerzeugern Deutschlands zählen
***	Very good producers, who constantly produce high quality wine.	Sehr gute Erzeuger, die seit Jahren konstant hohe Qualität liefern
**	Good producers, producing wines, which are above standard quality.	Gute Erzeuger, die mehr als das Alltägliche bieten
*	Reliable producers, producing wines with a basic quality.	Verlässliche Betriebe mit einer ordentlichen Standardqualität

Source: http://www.gaultmillau.de

producers (categories 4 and 5), one for category 3 and one for the producers with lowest reputation (categories 1 and 2). Concerning the expected signs of the variables, the first one is expected to be positive and the latter one negative. The strongest influence is most likely expected in Germany and the weakest in the Scandinavian countries, because the Scandinavian consumers are probably not aware of the characteristics of the single German producers.

Naturally, an *indicator for the individual quality* of the wine is expected to influence prices significantly, i.e. higher sensory rating of the wine must result in higher prices. Perhaps again the influence may be strongest in Germany. On the other hand, besides costs of importing the wines the Scandinavian retailers may stick to objective quality scales when pricing their wines. In the empirical analysis we use the sensory rating published in Gault Millau, i.e. points between 75 and 100 (maximum), see http://www.gaulmillau.de for further details.

Thus, the basic model which is estimated in the analysis can be described as

$$\begin{aligned}(1)\quad &\log(p) = \alpha + \beta \log(Ind.Quality) \\ &+\gamma(ProdRep) + \delta(RegR\,e\,p) \\ &+\varphi(Riesling) + \lambda \log(Prod.Size) \\ &+\omega \log(Yield) + \gamma_i\,'label.quality\,' + \varepsilon\end{aligned}$$

where '*Ind.Quality*' is the sensory rating of the wine, '*ProdRep*' is producers reputation and '*RegRep* is a series of dummy variables for the regions. A series of dummy variables are also added, which control for German compulsory quality categories shown on the label of the wine, i.e. '*label.quality*'. Sorted by ripeness of the grapes at harvest, dummy variables for 'Kabinett, Spätlese, Auslese, Beerenauslese, Trockenbeerenauslese and Eiswein' are included in the model. Furthermore a control variable for the grape variety, '*Riesling*' is included, because Riesling was traditionally the dominant German grape in the Scandinavian markets and even today most Scandinavians think of wines made of Riesling as superior to other brands from Germany. Finally, the total production of the producer is included in the model in order to take bargaining power between producers and buyers into account, '*Prod.Size*'. The larger producers are expected to have more bargaining power against buying firms, i.e. Scandinavian wine merchants, retailers etc. Therefore, prices on the Scandinavian markets may be affected positively by the size of the German producer. However, the potential influence is blurred as small producers may try to develop a brand, i.e. go for quality. So, producer size may affect prices both negatively and positively. We also add the average yield (*Yield)* of the producers as an explanatory factor, i.e. hectolitres per hectare. Smaller yield may be an indicator of better and more critical selection of grapes. Therefore, higher prices can be obtained.

4. Price analysis

In order to compare wine prices across countries, detailed micro-level information must be collected at the retail level, i.e. information on identical white wines is needed. Looking at the Scandinavian markets, wine prices at the retail level in Norway and Sweden can be obtained from the homepage of 'Vinmonopolet' (http://www.vinmonopolet.no) and 'Systembolaget' (http://www.systembolaget.se), because all wines are sold to private households through the shops of the monopolies in these two countries. Prices of German wines in Denmark are relatively difficult to collect on a systematic basis because of the huge volume of shops selling wine in Denmark. However, using a complete list of importers of German wine (Source: The German Wine Office in Denmark and VSOD, The Wine and Spirits Organisation in Denmark, http://www.VSOD.dk) and knowing about the major retailers through advertisements etc., a representative sample has been collected.

Having identified a sample of German white wines in each Scandinavian country, the market price as announced by the producers in Germany has been identified through *Gault Millau Weinguide* für Deutschland, see description above. Thus, bilateral comparison of the absolute prices of identical wines can be performed and it can be tested whether prices are relatively 'fair' in a specific Scandinavian country as compared to prices in Germany.

Finally, all prices are adjusted for taxes, i.e. the prices in the final data set are presented both *net of all wine-specific taxes and other sales taxes*, e.g. VAT, and in ordinary market prices. Prices were collected in August/September 2004[3] and they were converted into EURO. No correction has been made for differences in transportation costs. The German prices relate to 'ab Weingut', i.e. excluding transportation costs, and similarly for some of the Danish prices relating to virtual wine companies. In both cases, calculation of the final price should include shipment costs from the retailer to the consumer. The Swedish and Norwe-

[3] A few extra prices on the Swedish market were collected in spring 2005 in order to further increase the number of observations.

gian prices are measured at the retailer's shop. This means that some people would have to order by post and thereby pay transportation costs, too. Thus, in all countries shipment costs must potentially be added for some of the wines and for some part of the population. Still, no correction was made – probably resulting in a minor downward bias in the German prices.

Figures 2 to 4 give bilateral price comparisons, i.e. prices in each of the Scandinavian countries against prices in Germany on identical wines in terms of Euros per bottle. The figures include retail prices, i.e. market prices and prices net of general taxes and wine duties.

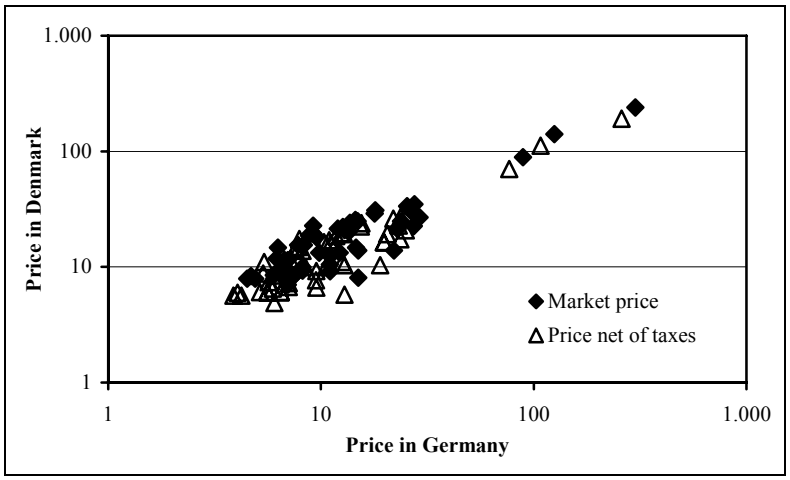
The figures clearly indicate that German wines are relatively more expensive in Scandinavia as compared to Germany. In all the Scandinavian countries, wines measured in market prices, i.e. including taxes, are more expensive than in Germany, whereas the picture is more blurred when looking at the figures net of taxes. Looking at Norway and Sweden, 90% and 89% of the wines are more expensive than in Germany when taxes are included, but if prices are corrected for taxes, only 66% and 51% are more expensive than in Germany. Thus, a notable part of the tax burden seems to be carried by the producers/retailers. The similar figures for Denmark, where the taxes are lowest in Scandinavia, are 76% and 52% suggesting that the Danish taxes – to some extent - are also carried by the producers/retailers. Finally, the figures show a tendency towards relatively lower prices in the Nordic countries the more expensive the wine is, i.e. the wine duties are fixed non-ad valorem taxes.

Table 4 presents the bilateral comparison of prices in order to answer whether the Scandinavian consumers pay excess prices for German white wines. Looking at the sub samples there is a tendency that Danes import higher priced wines as compared to Norway, i.e. the average price is around 22 Euros *vs.* 17 Euros in Norway – with Sweden in between. However, testing for bilateral price differences against the producers' announced prices in Germany, prices in Norway and Sweden are significantly higher than in Germany.

Furthermore, correcting for taxes results in narrowing the prices. In fact, prices net of taxes are lower in Denmark as compared to Germany. Note that the test-statistics concerning differences in average prices do not indicate that these differences deviate significantly from zero.

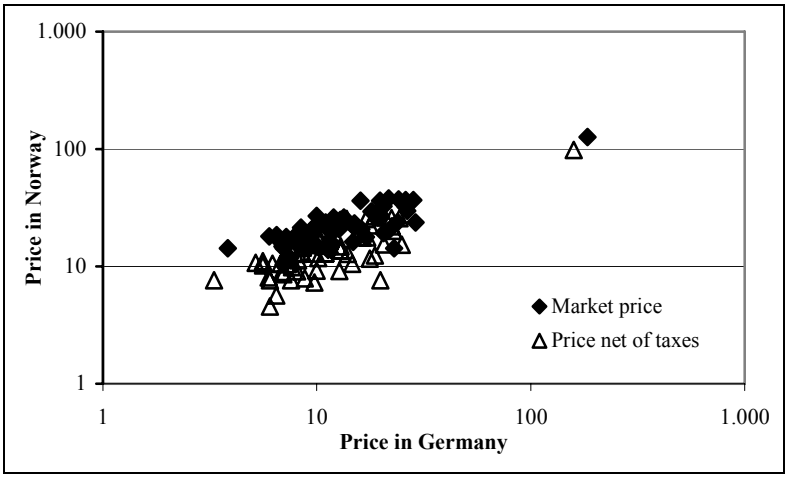
Finally, together with figures 2-4, table 4 suggests that a number of the wines are cheaper in the Scandinavian countries - even when taxes are included. In Denmark, 24% of

Figure 2. Retail prices for German white wines. Denmark vs. Germany, EURO per bottle, 51 wines; market prices and prices net of taxes, log scale



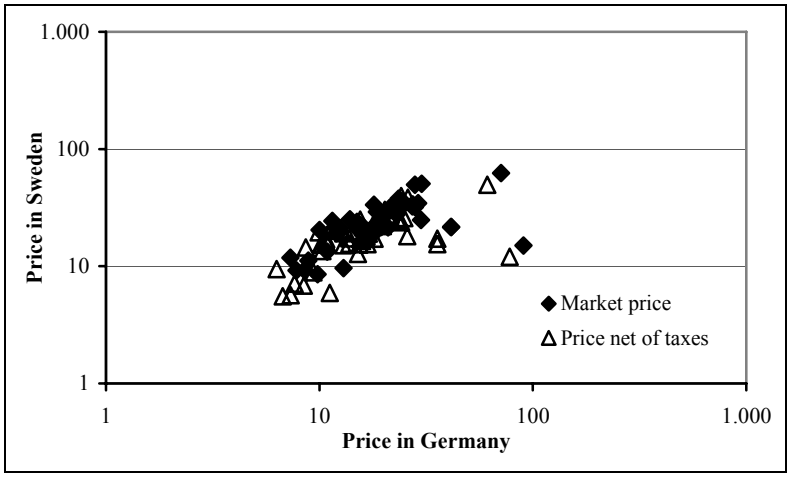
Source: http://www.gaultmillau.de

Figure 3. Retail prices for German white wines. Norway vs. Germany, Euro per bottle, 61 wines; market prices and prices net of taxes, log scale



Source: http://gaultmillau.de

Figure 4. Retail prices for German white wines. Sweden vs. Germany, Euro per bottle, 45 wines; market prices and prices net of taxes, log scale



Source: http://www.gaultmillau.de

Table 4. Comparison of prices for German white wine, Germany vs. the Scandinavian countries

	Denmark	Norway	Sweden
Average absolute price difference (EURO), (Scand. price minus German price, market prices)	2.82	7.11	3.21
Standard error of absolute price difference (market prices)	(10.403)	(9.897)	(14.368)
Test-statistic for absolute price difference	0.346	2.039*	1.141*
Average absolute price difference (EURO), (Scand. price minus German price, prices net of taxes)	-1.45	0.07	-2.15
Standard error of absolute price difference (prices net of taxes)	(13.274)	(10.395)	(13.080)
Test-statistic for absolute price difference	-0.20	0.021	-0.857
Share of wines where P-Scand. is greater than P-Germany (market prices)	76%	90%	84%
Share of wines where P-Scand. is greater than P-Germany (net of taxes)	52%	66%	51%
Avg. price in Germany (EURO), (market prices)	22.13	16.72	21.64
Number of wines in each sample	51	61	45

Note: * indicates significance at the 5% level.

Source: see section 4

the wines included in the sample are cheaper than in Germany and measuring net of taxes more than 50% of the wines are cheapest in Denmark – compared to Germany. The similar figures for Sweden are 16% and 49%. Thus, producers seem to carry a significant part of the tax burden. Even in Norway, 34% of the wines are cheaper than in Germany, when correction has been made for taxes. In sum the Scandinavian consumers pay a 'fair' price for German white wines.

5. Regression analysis

The average price differences suggest that Scandinavian consumers do not pay excess prices for German wines. However, that part of the analysis does not answer whether the *price structure* is logic in each country. In order to test this we set up the hedonic price function in market prices as shown in equation (1) and table 5 shows the estimation result for each country and all countries pooled together by using a backward elimination technique. Thus, initially all explanatory variables are included in the model, but step by step the algorithm (in SAS) eliminates variables that are not significantly different from zero at the 10% level. The final results shown in the table represent the outcome of a series of backward elimination experiments with equation (1).[4]

Looking at Germany, producer's prices are positively correlated with individual quality of the wine (sensory rating), the label quality, and the producer's size. Furthermore, wine produced in Baden/Franken has a positive premium compared to other regions. Note that the positive influence from label quality has the expected relative magnitude, i.e. positive and increasing with higher ripeness. Finally R^2 is fairly high.

The estimation results for Sweden are presented in column 3. The backward elimination procedure suggests that the individual quality of the wine has an influence of the same sign magnitude as on the German market. Furthermore, wine from Baden/Franken and Rheinhessen gives relatively higher prices, which is also the case for wines made from Riesling. The label quality, Spät- and Auslese has the expected sign and relative size – note that Eiswein is not included in the Swedish sample. Average yield has a negative influence, which may indicate that producers who are more selective in the production obtain higher prices. Finally, the model performs rather well in general, i.e. R2 is around 80.

The prices of German wines follow the pattern in Germany and Sweden. Label quality and the sensory rating of the wines are highly significant and positive. The influence of the latter has the same size as in Germany and Sweden. Moreover our experiments (not shown) indicate that if restrictions were imposed on the parameter for sensory rating across countries it could not be rejected that the influence of sensory rating is the same at the markets in Denmark, Sweden and Germany. However, at the Norwegian market sensory rating is insignificant and the experiments gave no evidence that this influence in Norway was the same as in the other countries. Yet, looking at the estimation form where data for all countries are pooled, the influence from individual quality is positive and significant but smaller than in Denmark, Sweden and Germany, which is of course due to the Norwegian influence.

Focusing on producer reputation there seems to be a positive influence on the prices for the group of the very best producers on the Danish and Norwegian markets but not in Sweden or Germany. Again the experiments – restricting the parameter - showed that it cannot be rejected that this influence is the same in Denmark and Norway. Finally it should be noted that there is nearly no influence from regional reputation in both Denmark and Norway.

Focusing on the results when pooling data for all countries we get quite significant parameters with the expected sign and size for nearly all potential explanatory factors. Sensory rating matters, the large producers experience higher prices,

[4] In order to test the robustness of the selection process different numbers and combinations of the gross number of variables were used in the initial round in the backward selection procedure. Thus, the results presented are fairly stable.

Table 5. Regression analyses of the market prices for German white wines, pooled and by country, prices on left-hand side (log values – backward elimination estimation method)

Variable	All countries (pooled)	Germany (producer's price)	Sweden	Norway	Denmark
Dummy for Sweden	0.331*** (0.072)				
Dummy for Norway	0.411*** (0.064)				
Dummy for Denmark	0.249*** (0.070)				
Individual quality, sensory rating (log)	6.244*** (1.035)	7.898*** (1.413)	8.425*** (1.361)		7.458*** (1.869)
Size of producer, log (total hl.)	0.170*** (0.043)	0.205*** (0.061)		0.181*** (0.059)	0.321*** (0.089)
Yield (log hl/ha)	-0.551*** (0.174)		-0.833*** (0.281)	-1.205*** (0.202)	
Regional reputation: dummy for Baden and Franken	0.504*** (0.180)	0.340** (0.169)	0.982*** (0.303)		
Regional reputation: dummy for Rheinhessen	0.245** (0.124)		0.831*** (0.194)		
Regional reputation: dummy for Rheinpfalz				0.284** (0.137)	
Regional reputation: dummy for Mosel	0.109* (0.060)				
Regional reputation: dummy for Riesling	0.396*** (0.149)		0.464* (0.246)		
Dummy for 2003	0.111* (0.064)	0.262*** (0.101)			
Dummy for 2002				0.124* (0.071)	
Dummy for producer's reputation (3-star in Gault Millau)	0.152** (0.077)				
Dummy for producer's reputation (4- or 5-star in Gault Millau)	0.155* (0.080)			0.264*** (0.069)	0.232* (0.136)
Dummy for Spätlese	0.279*** (0.066)	0.252** (0.105)	0.461*** (0.109)	0.337*** (0.063)	1.094*** (0.216)
Dummy for Auslese	0.420*** (0.086)	0.377*** (0.134)	0.545*** (0.148)	0.572*** (0.076)	0.357** (0.145)
Dummy for Beerenauslese and Trockenbeerenauslese	0.445** (0.198)				
Dummy for Eiswein	1.405*** (0.174)	1.380*** (0.268)			1.094*** (0.216)
Adj. R^2	0.704	0.610	0.818	0.762	0.852
Number of observations	213	106	30	42	35

Note: Intercepts not shown. Values in brackets are standard errors of the estimated parameters,
*** indicates significance at the 1% level, ** at the 5%, level, and * at the 10% level of significance.

Source: see section 4

i.e. the small producers have less market power. Alternatively, the small producers might have been seen as wineries supplying or specializing in wines of better quality and thus also experiencing higher prices compared to the high-volume producers, although this effect does not seem to be supported by the analysis. Note that this effect may be caught by the yield variable, which is negative as expected, i.e. the smaller producers may be more selective in their production when picking grapes. Several of the regional dummies are significant and producer reputation also matters – 4- and 5-star producers get the highest prices.

The sign and relative size of label quality are as expected. Thus, the parameter of the dummy variable for Spätlese is smaller than for Auslese, which is again smaller than for Beerenauslese etc. Overall the model explains 70% of the variation in the wine prices.

Finally, looking at the country dummies in the first column suggests that the (log)prices (correctly) are highest in Norway where taxes are highest. However, the estimated parameters are only slightly different and much more alike than should be expected because of tax differences, see table 1.

The empirical findings are partly in line with other studies using the hedonic pricing model, see SCHAMEL (2000) who finds regional reputation and sensory rating important for Californian wines, and SCHAMEL and ANDERSON (2003) who find that regional reputation and sensory quality rating matter for Australian wines and wines from New Zealand.

However, OCZKOWSKI (2001) finds insignificant quality effects but significant reputation effects for premium Australian wines. LANDON and SMITH (1998) find significant effects on prices of Bordeaux wines from expected quality (reputation) but not from short term quality improvements. An obvious explanation for this is the fact that Bordeaux wines or other premium wines are generally better known to the relevant consumers compared to the conditions for German white wines in Scandinavia, where consumers may have more sparse information about German wine production. Finally our results are to a large extent comparable and in line with SCHAMEL (2003). Thus, individual quality and label quality has similar influence in both studies of German wine, whereas the regional influence is comparable.

6. Conclusion

German white wines was traditionally popular in the Scandinavian countries and the market shares among all white wines have been relatively high, especially in Norway, but in recent years competition from 'new' wine producers (Chile, Australia, South Africa) as well as other European wine producers has initiated a path of declining market shares for the German (white) wines. In the analysis, data for the prices of more than 150 German premium white wines which can be found on at least one of the Scandinavian markets have been collected. Not surprisingly, the German wines are relatively most expensive – when evaluated in market prices – in the Scandinavian countries, which is straightforward to explain via the wine taxes, e.g. especially for Norway that has rather extreme excises for all kinds of alcoholic beverages. When evaluating the same wine prices net of wine taxes and VAT, the price differences between the German and Scandinavian markets for white wines are only modest and not significant, i.e. indicating 'fair' prices in Scandinavia for German white wines. For some of the wines, the prices net of taxes are even lower on the export markets compared to Germany thus indicating that the producers carry some of the Scandinavian tax burden. Moreover, comparing the country specific factor in the hedonic price model, price differences vanish even more, suggesting that average prices of German white wines in Scandinavia are fair especially in Norway and Sweden – but also in Denmark.

According to the German wine law the wines are categorized according to the ripeness at harvest and the quality is announced on the label. Furthermore, within each category sensory quality ratings of the individual wines exist. E.g. the German Gault Millau Wine Guide shows this information as well as an indicator for the general reputation of the producers. This information is used in relation to modeling the prices of the German wines as a function of these quality indicators along with variables such as the regions of production (Mosel, Saar etc.) and the size of the producers. When estimating such a hedonic price model at each market, an indication of the logic of price structures is obtained for each country. The results show that the number of significant explanatory factors varies, but overall the hedonic pricing models perform well and except for Norway sensory quality rating of the individual wines has the same influence at each market. Thus, it can be concluded that the price structure for German wines on each of the Scandinavian markets is logic with respect to basic quality indicators and other attributes.

Using the pooled data set covering all the Scandinavian countries and the German producers' suggested prices, the individual quality of the wine also gives a highly significant parameter estimate. This is not a big surprise as the rating of the wines must also be expected to be reflected in the price structure. The label quality is an important factor on all markets, with higher prices for Spätlese compared to Kabinett and QbA, higher prices for Auslese compared to Spätlese etc. This influence is significant in each country. There is also evidence that producer reputation has a positive influence on prices, whereas the influence from regional reputation is more unclear. Yet, wines from Baden and Franken seem to give a notably higher price especially in Germany and Sweden.

In sum, the price structure of premium German wine appears to be logical and, looking across countries, Scandinavian consumers do pay a fair price as compared to German consumers. Of course this does not answer the question whether German white wines in the opinion of the Scandinavian consumers are too expensive relative to premium white wines from other wine producing countries. Under the headline 'The undiscovered country' the Danish Wine Magazine (Vinbladet) published a special issue in 2003 about German wine. The expert's option on the quality and richness of German wines is clear and most positive. However, the question and part of the answer for the declining market shares on the Scandinavian markets most likely lies in the title of the of the article: The Scandinavian consumers haven't found out!

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Annex. Summary statistics of key variables in the data set

	Number of observations	Mean	Std.dv	Minimum	Maximum
Price in Germany*	152	20.02	30.52	5.80	299.99
Price in Denmark	51	24.95	37,50	6,99	240,05
Price in Sweden	45	24.84	10.94	8.54	62.22
Price in Norway	61	23.82	15.02	10.41	126.43
Size of producer, total hl	149	186281	312160	13000	2500000
Yield, Hl/ha	149	60	9	40	82
Sensory rating. Points in Gault Millau, 75-100)	94	87.87	3.01	81	95

* Vintages included: before 2000: 6 bottles ; vintage 2000: 6 bottles; vintage 2001: 25 bottles; vintage 2002: 83 bottles; vintage 2003: 32 bottles

Source: see section 4