

# THE GERMAN WINE INDUSTRY: RIPE FOR E-COMMERCE?

by

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## 1 INTRODUCTION

Recently one of us visited an exhibition about the Romans north of the Alps. In their time the Romans were "globalizing" the ancient world: They spread their language, virtues, vices, their technologies, and their law all across the Mediterranean and western Europe.

Drinking wine was one of the Roman vices and, fortunately for Germany, the Romans brought viticulture to where they settled and built bases. The Romans are long gone but viticulture took root and is flourishing in Germany. We are experiencing another wave of globalization whose core technology is the Internet. This technology is beginning to transform the German wine industry. Early signs of the transformation abound. Wine makers who may not have changed the style of their labels for decennia, suddenly add email addresses to their catalogs and promotional brochures. Also, some have built web sites where they tell the story of their vineyards, cellars, and wines, and where they proudly show pictures of their property.

Are this the activities of a small number of technophiles or are they the forerunners of a new development in the industry? Who are the early adopters, what elements of e-commerce do they adopt and with what success? Are the early adopters too early for their own good or is the German wine industry ripe for e-commerce? What can we learn from e-commerce in the wine industry that is relevant for the rest of agriculture?

We, that is a couple of my students, Dan Sumner and I, have recently started a research project on the adoption and impact of e-commerce in the wine industries of California and Germany. For several reasons the two wine industries are excellent candidates for a comparative case study of the early transition of agriculture towards e-commerce:

- (1) Wine is a highly differentiated, internationally traded experience product.
- (2) Early adoption of e-commerce occurred in the wine industry soon after the Internet was opened for commercial use. For example, Virtual Vineyards opened its web site as early as 1995. E-commerce is therefore likely to be more advanced in this than in other agricultural industries.
- (3) The industries are characterized by a mixture of small and large producers and marketing channels differ. California's more than 740 commercial wineries are predominantly family owned

and operated businesses. A small number of large wineries have established brands that are well known at home and abroad and they market their produce through established retail channels. Many of the small wineries are unknown but to a small band of cognoscenti and they sell directly to consumers. The wine industry in Germany is also characterized by many small wine producers, who often market their wines themselves. In contrast to the industry in California, however, there are no large wineries with well-established brands. Furthermore, in contrast to California where sales of grapes and juice are common, this practice is rare in Germany.

(4) The regulatory environments differ. The marketing activities of the small wineries in California, which do not have extensive distribution channels, are obstructed by wine shipment regulations of most states in the US and only 12 states allow free trade of wine over state borders. In Germany, in contrast, the production of wine is subject to elaborate EU and national regulations but trade in wine is free within in the EU.

(5) There are likely to be significant differences in the e-commerce readiness of the wine industries in the two countries. In particular, the California wine industry is likely to benefit from the head start in Internet diffusion that the US enjoyed over other countries.

As is appropriate at an early stage of research, we are currently assembling basic facts about the two industries and the e-commerce activities within them. In my presentation I shall report on what we have found out at this stage about e-commerce in the German wine industry.

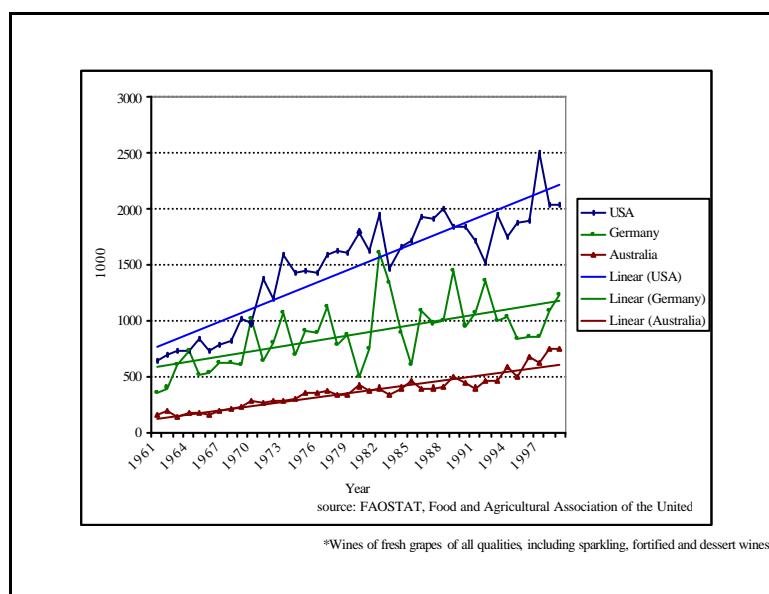
Because I am speaking at a wine workshop and not at an e-commerce event, I emphasize in my presentation aspects of the Germany wine industry. Keeping in mind the time constraint, I first present a few basic facts about the German wine industry. Then I identify some factors that can be expected to affect the adoption and diffusion of e-commerce in the German wine industry.

## 2 THE GERMAN WINE INDUSTRY

### 2.1 Production

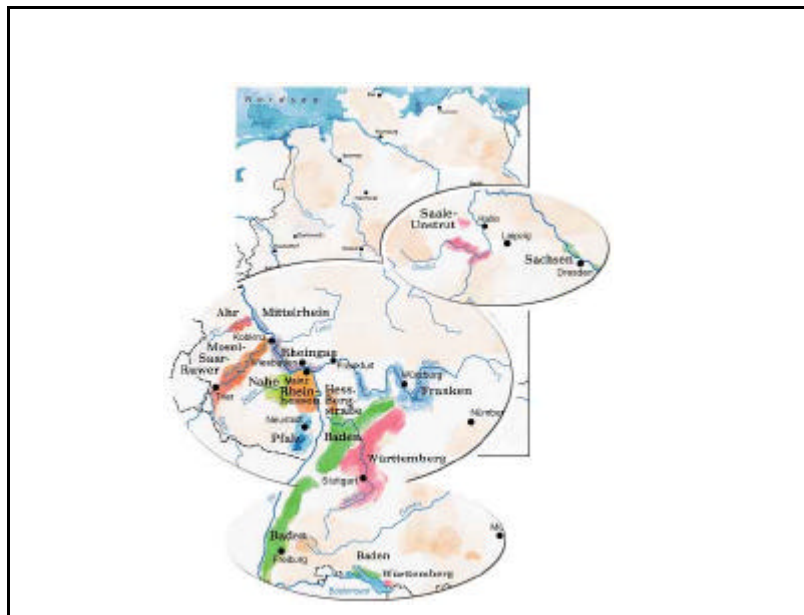
Wine production in Germany has more than doubled over the last thirty years and now stands at about 12 million hectoliters or 1.2 million tons. On average production of wine has grown by 15,500 t per year compared to 38,000 t in the USA.

**Figure 1: Development of wine production 1961-1999**



Wine is grown in Germany as far north as 52° latitude and Germany's wine growing regions are among the most northerly ones in the World. Advantages of growing wine this far north are a long growing season and moderate summer temperatures. The disadvantages are lack of sunshine in some years, and variable wine quality. Scarcity of sunshine also explains why viticulture in Germany, with the exception of Saale-Unstrut and Sachsen in the east, is concentrated in the southern and southwestern parts of Germany, where spring starts early and which are favored by climate and topography.

**Figure 2: The 13 wine growing regions in Germany.**



Wine is produced in thirteen vine growing regions defined by law. The regions are:

- |          |                 |             |                          |
|----------|-----------------|-------------|--------------------------|
| 1. Ahr   | 2. Mittelrhein  | 3. Rheingau | 4. Mosel-Saar-Ruwer      |
| 5. Nahe  | 6. Rheinhessen  | 7. Pfalz    | 8. Hessische Bergstrasse |
| 9. Baden | 10. Württemberg | 11. Franken | 12. Saale-Unstrut        |
|          |                 |             | 13. Sachsen              |

A brief description of the areas is given in the appendix.

Total vineyard area in Germany is slightly above 100,000 ha with an average yield of 10.8 t/ha of must. In Germany production of white wines dominates the production of red wines by far. The proportion of wines of basic quality is about equal to the share of higher quality wines. The share of table wines, the lowest of the qualities, in total production is negligible.

**Table 1: Vineyard area, must production, and composition of wine production in the wine regions of Germany, 1999.**

Wine Growing regions	Must production [1000 t]	% of total must production	Vineyard area [ha]	% of total vineyard area	Must yield [hl/ha]	Proportions of wine quality categories			White [%]	Red [%]
						Table wines [%]	Quality wine [%]	Quality wine with special attributes [%]		
Rheinhessen	316	26	25442	25	124	0.2	39	61	87	13
Pfalz	270	22	22504	22	120	0.4	46	54	79	21
Württemberg	158	13	10856	11	145	0.2	43	57	42	58
Baden	157	13	15311	15	103	0.2	42	58	68	32
Mosel-Saar-Ruwer	154	13	11336	11	136	0	54	45	98	2
Franken	72	6	5843	6	124	1.5	64	34	92	8
Nahe	47	4	4457	4	105	0.7	33	66	90	10
Rheingau	33	3	3130	3	107	0.6	38	61	88	12
Mittelrhein	5	0.4	554	0.5	97	0	38	62	93	7
Ahr	5	0.4	510	0.5	105	0.3	19	81	18	82
Hessische Bergstraße	5	0.4	443	0.4	104	0	26	74	92	8
Saale-Unstrut	4	0.3	545	0.5	77	1.6	85	13	82	18
Sachsen	2	0.2	342	0.3	61	0.8	54	45	92	8
<b>Germany</b>	<b>1228</b>	<b>100</b>	<b>101273</b>	<b>100</b>	<b>108</b>	<b>0.5</b>	<b>45</b>	<b>55</b>	<b>79</b>	<b>21</b>

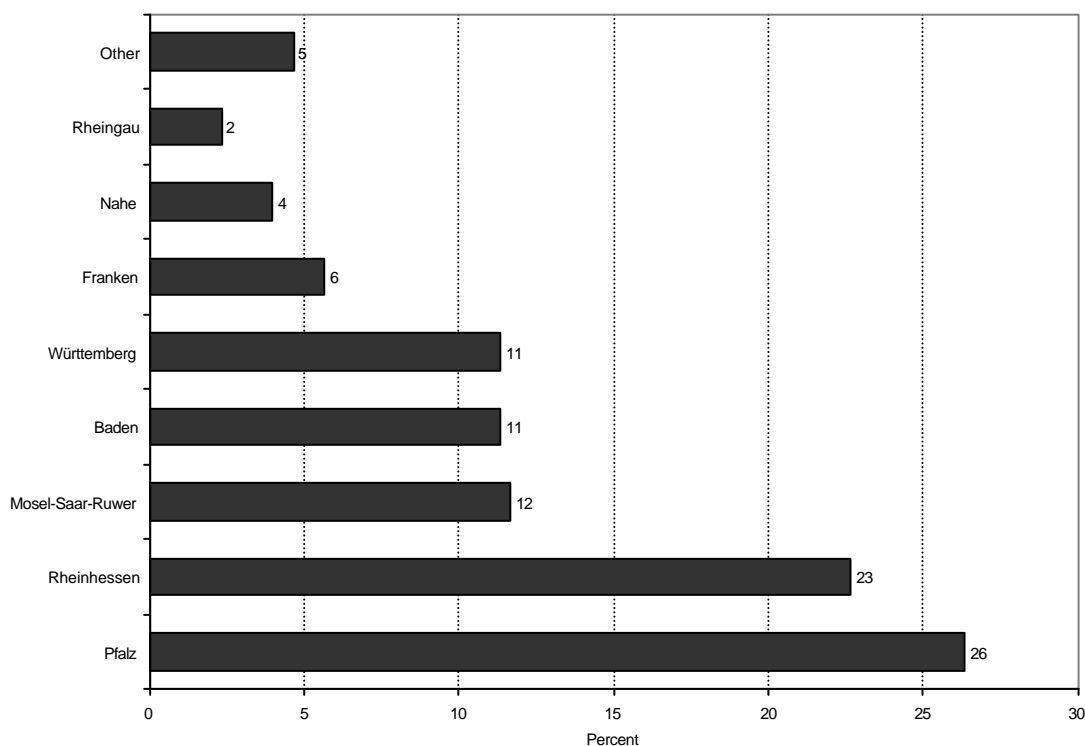
Quelle: BMELF

## 2.2 Consumption

Wine is consumed by about two thirds of all German households and per capita consumption stands at about 23 l per year.

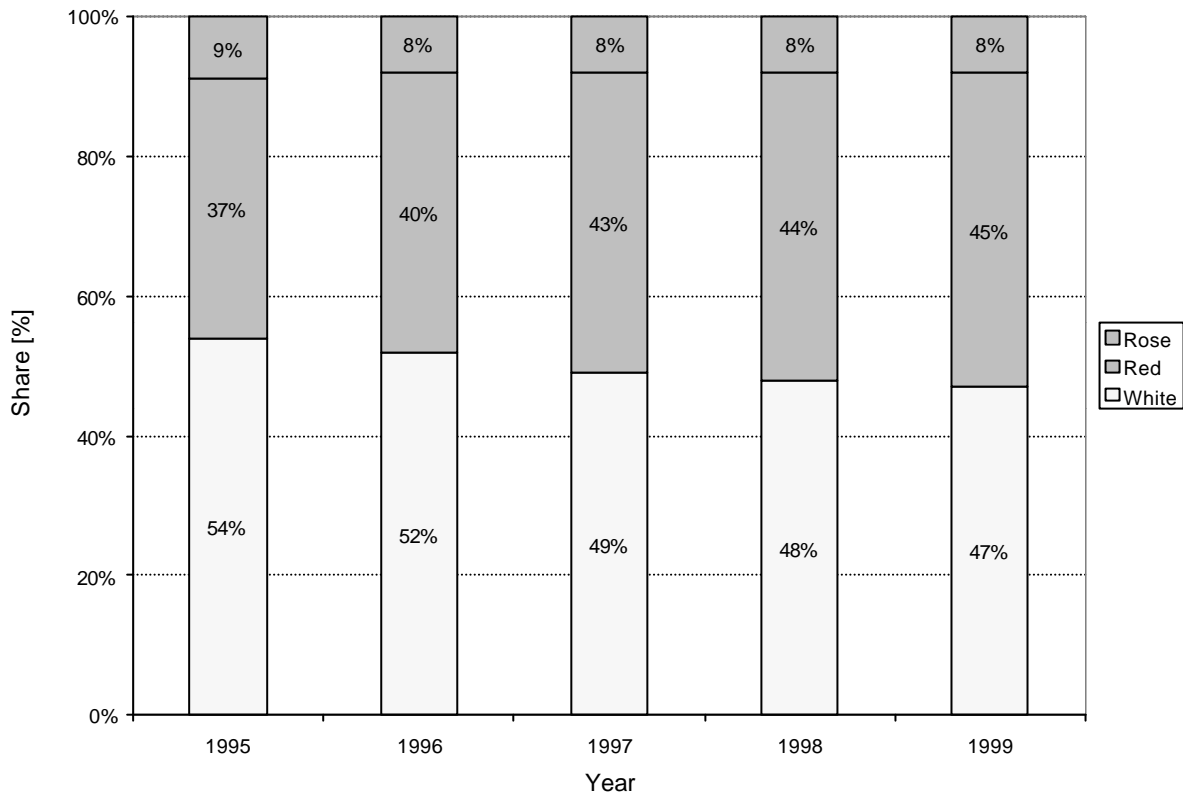
The shares of the wine regions in domestic consumption roughly reflect their shares in production, with the exception of Rheinhessen and Pfalz: Rheinhessen is Germany's number one wine producer in most years but the Pfalz is the number one region in terms of domestic wine consumption.

**Figure 3: Shares of the wine regions in consumption of German wine, avg. 1997-1999.**



Although Germany produces mostly white wine and the share of red wine in domestic production is only about one fifth, the share of red wine in domestic consumption has been growing during the last years and is approaching the share of white wine. Obviously, most of the red wine consumed in Germany is imported.

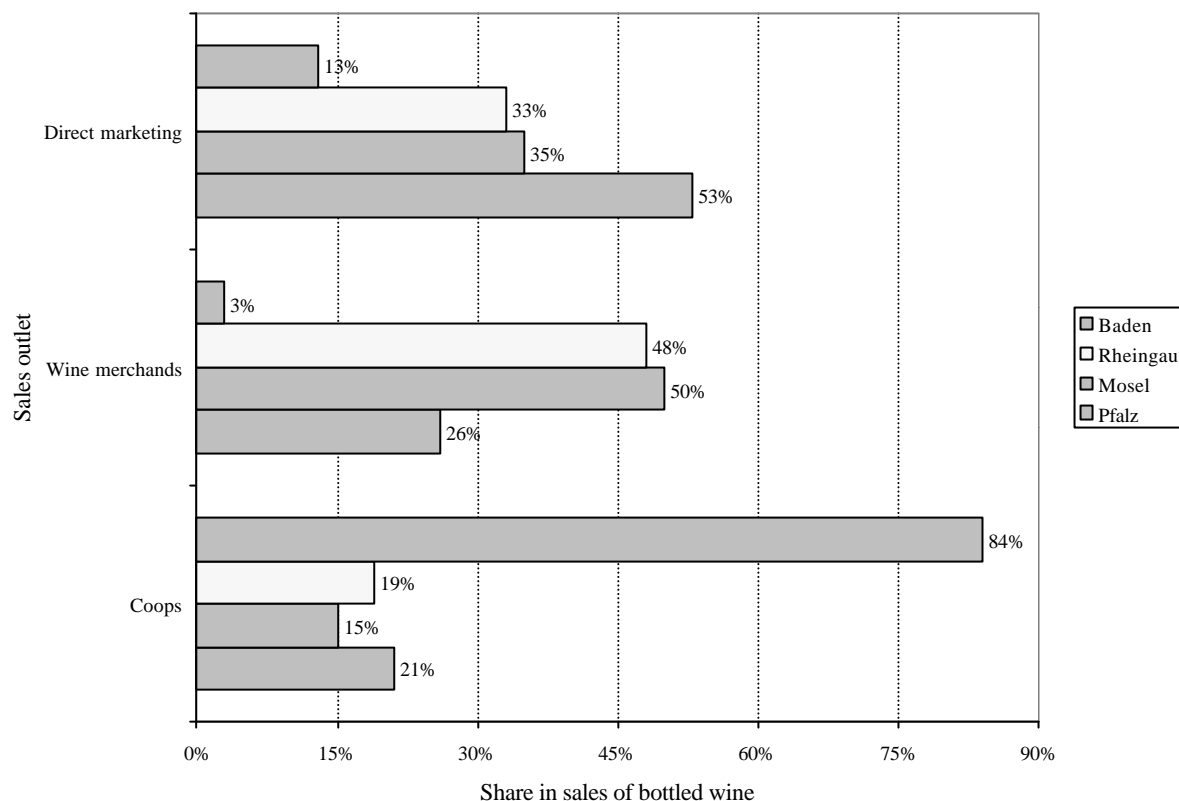
**Figure 4: Shares of red and white wine in domestic consumption, Germany, 1995-1999.**



### 2.3 Sales outlets

Major sales outlets for German wine are discounters which sell about two-thirds of the wine bought in Germany; the next most important outlets are food retailers (24%), wineries and producer coops (19.3%), and specialist wine shops (7.4%). Together these four outlets account for nearly 90% of domestic wine sales. There are, however, marked regional differences in the importance of the sales outlets. For example, in the Baden region, where coops are strong, they account for 84% of the wine produced in the region, whereas coops have a much smaller share in the Mosel and Pfalz regions, where much more wine is sold directly by the wineries themselves.

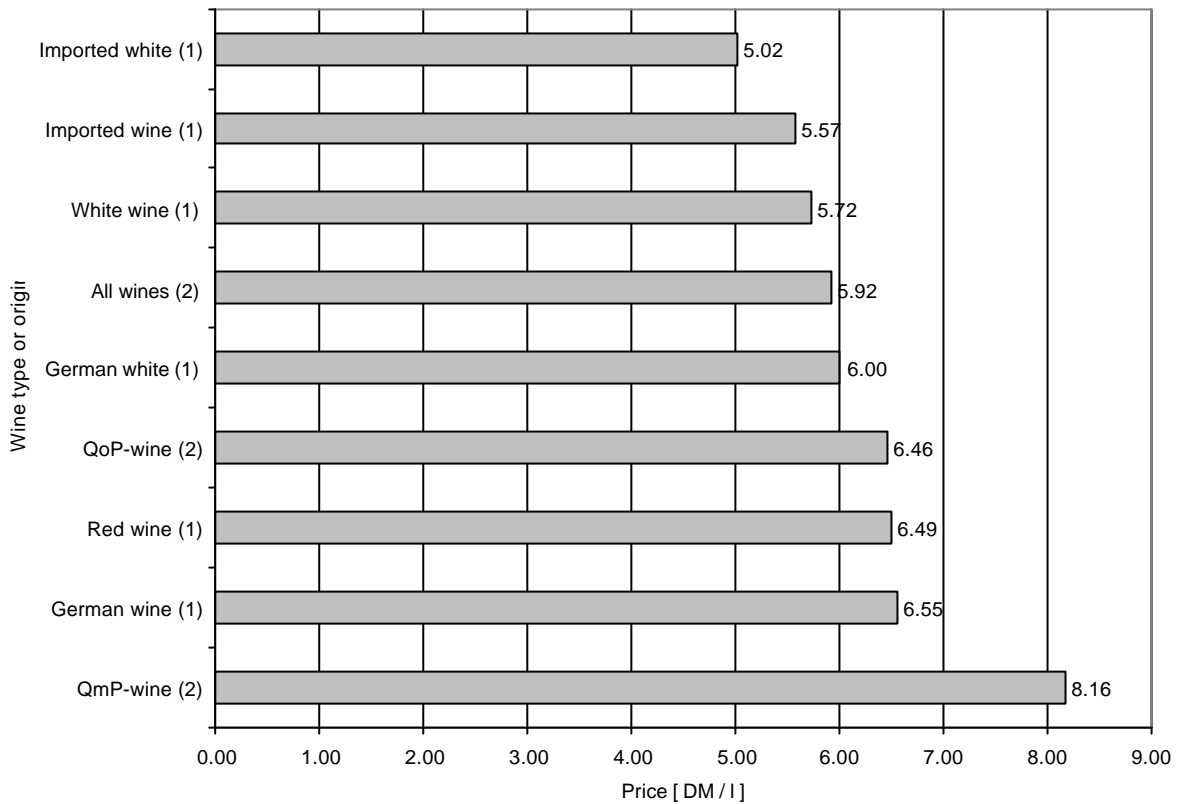
**Figure 5: Importance of sales outlets for wine in four areas of Germany, 1993.**



## 2.4 Prices

Among the various wine types and qualities, domestically produced quality wines and red wines command sell at a premium whereas imported whites fetch the lowest prices. Recently, there also is a large price spread between German whites and reds. Producer prices for Riesling are currently as low as 0.70 DM/l but Dornfelder red wine sells for more than 4.50 DM/l.

**Figure 6: Consumer prices of wine by wine type and origin.**



Levels of domestic consumer prices for German wine are inversely related to the size of the growing regions. They are lowest for wine from Rheinhessen, Pfalz, and Mosel, highest for wine from the small Franken and Nahe regions, with wine prices from Baden, Württemberg, and Rheingau lying in between the extremes.

**Table 2: Variation in consumer prices for wine from the German wine regions, 1999.**

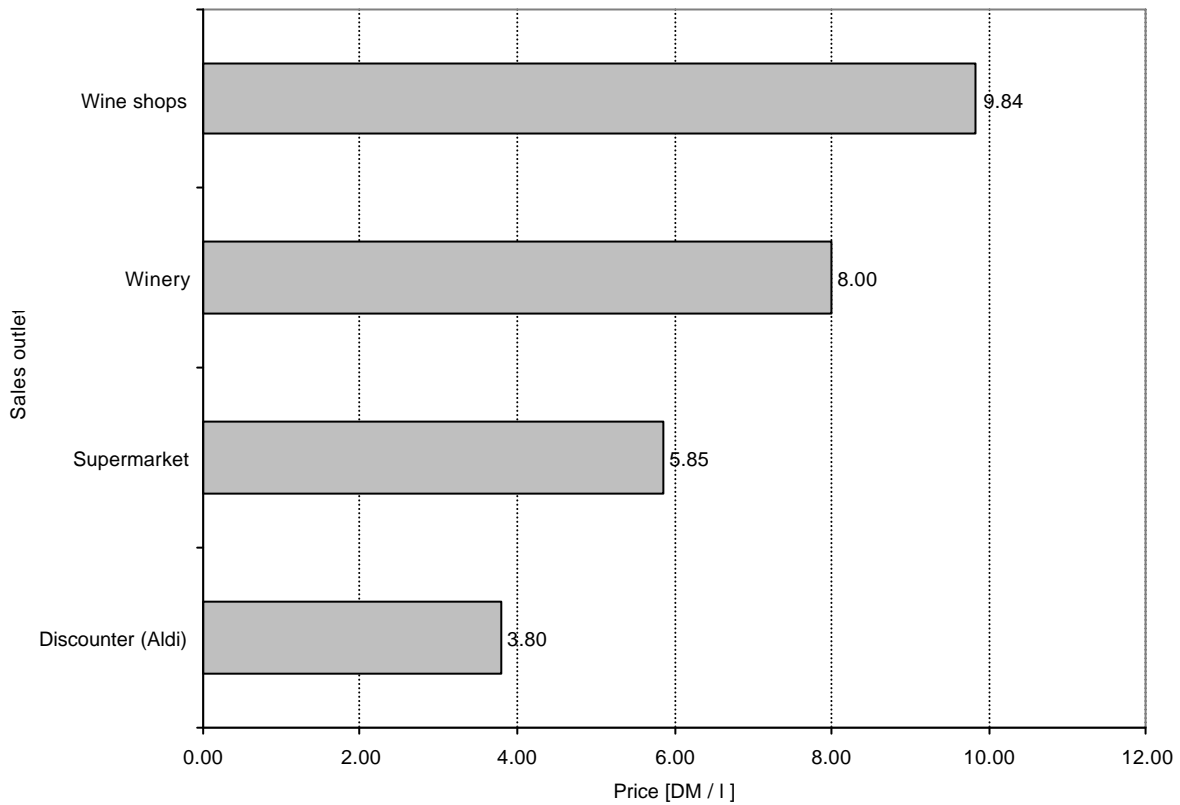
Price bracket	Area	Rank
5.00 - 6.00 DM / l	Rheinhessen Pfalz Mosel	Lowest
6.00 - 7.00 DM / l	Germany Baden	
7.00 - 8.00 DM / l	Rheingau Württemberg	
8.00 - 9.00 DM / l	Franken Nahe	highest

Source: MAFO 1/2000

As can be expected, retail prices for German wine are lowest in the Aldi discount chain and

highest in the specialist wine shops. The price difference between wineries and wine shops is remarkable. I can't think of any reason why consumers should buy higher quality wines when buying from a wine shop than when buying directly from the winery. Even if consumers bought wine only in small quantities from wineries, the shipping cost would be lower than the difference in average consumer prices.

**Figure 7: Average prices paid for German wine, by sales outlet, 1999.**

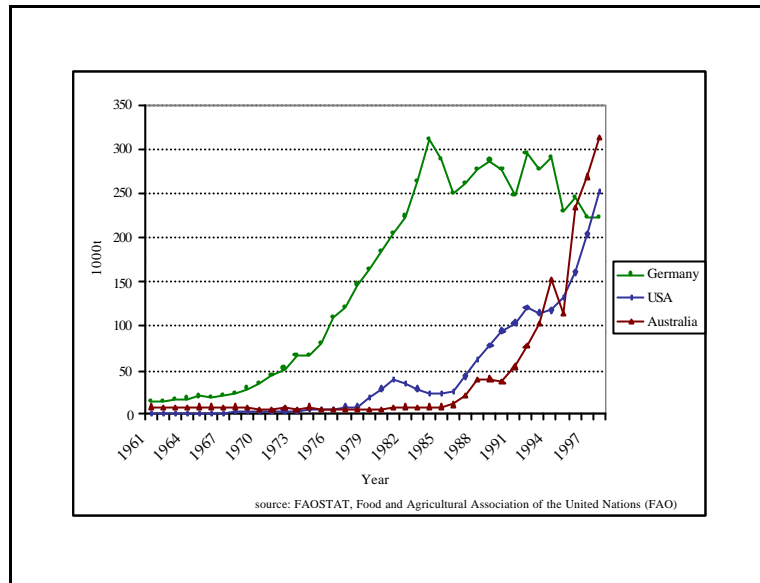


## 2.5 Exports

Wine exports from Germany went through three phases. Starting from a low level, wine exports increased steadily in volume and value throughout the seventies. In the eighties volume of export kept growing initially whilst value stagnated and when value picked up again in the late eighties, volume dropped and rebounded gain. During the last decade both value and volume of wine exports varied erratically along a downward trend. Currently wine exports account for about 20-25% of Germany's wine production.

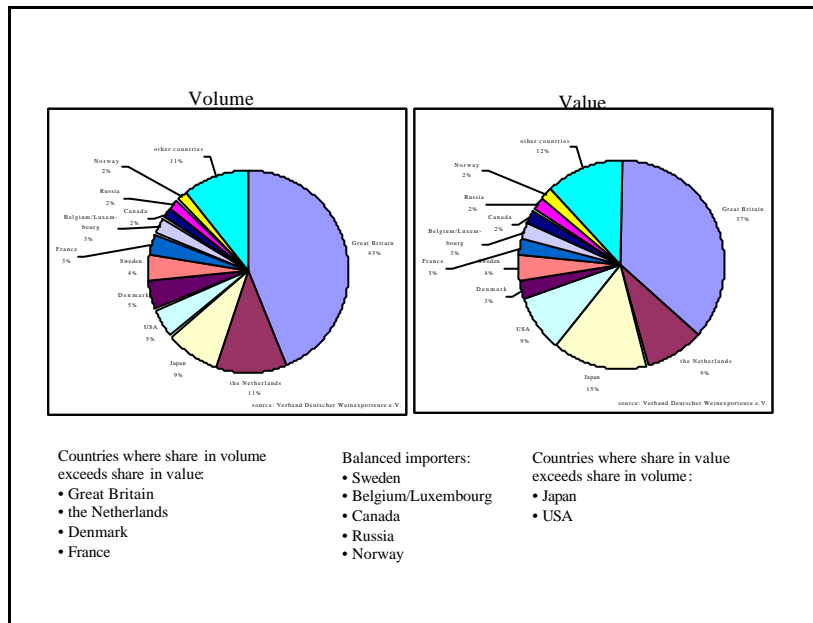


**Figure 8: Development of wine exports (volume and value), 1961-1998**



Germany exports wine to more than 140 countries but only few countries are important as importers. The four largest importers in terms of volume imported are Great Britain, the Netherlands, Japan, and the USA. Among them they account for about two-thirds of Germany's wine exports. Japan and the USA are also importers of higher priced German wines as their shares in the value of German wines exceeds their shares in export volume.

**Figure 9: Destinations of Germany's wine exports, volume and value, 1998**

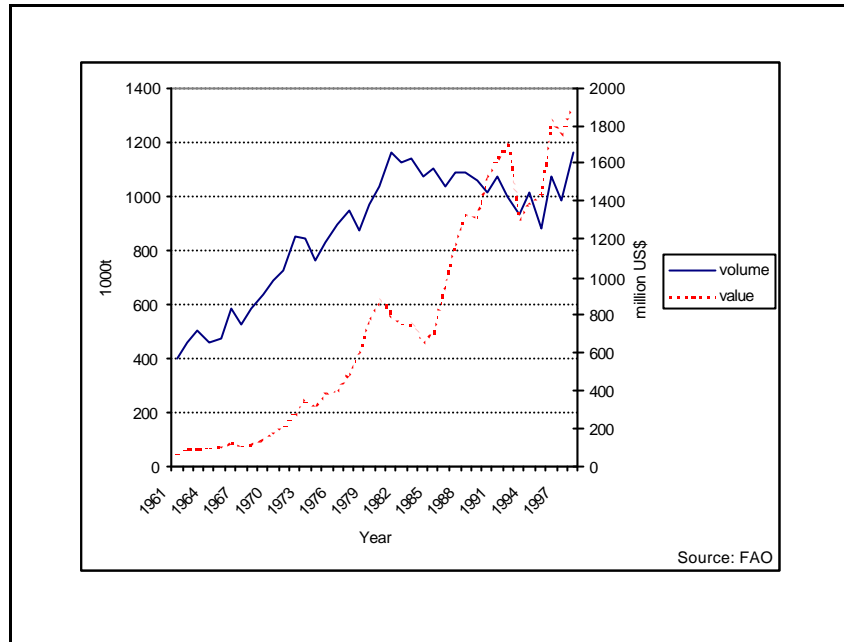


## 2.6 Imports

The volume of wine imports to Germany rose with a few interruptions throughout the 60s and 70s and into the early 80s when volume approached 1.2 million tons. Then followed a period of unsteady decline which lasted into the late 90s and only in the last few years have imports grown

again to the level of the early 1980s.

**Figure 10: Development of German wine imports (volume and value), 1961-1998.**



The development of the value of wine imports differs markedly from the development of import volume. A period of slow growth during the 60s was followed by strong growth during the 70s. Total value of imports dropped during the early 80s but this trend was reversed when total value increased again for nearly a decade. After a sharp drop in the early 90s value has increased again during the last few years.

Most of the wine imported to Germany originates from countries within the EU, irrespective of whether imports are measured in volume or value. By definition, all quality wines are imported from the EU and wines imported from outside the EU are reported as table wines, i.e. the lowest quality category of EU wines. On average, prices of non-EU imports are lower than prices of EU imports, as is indicated by the higher share in volume than in value of non-EU imports.

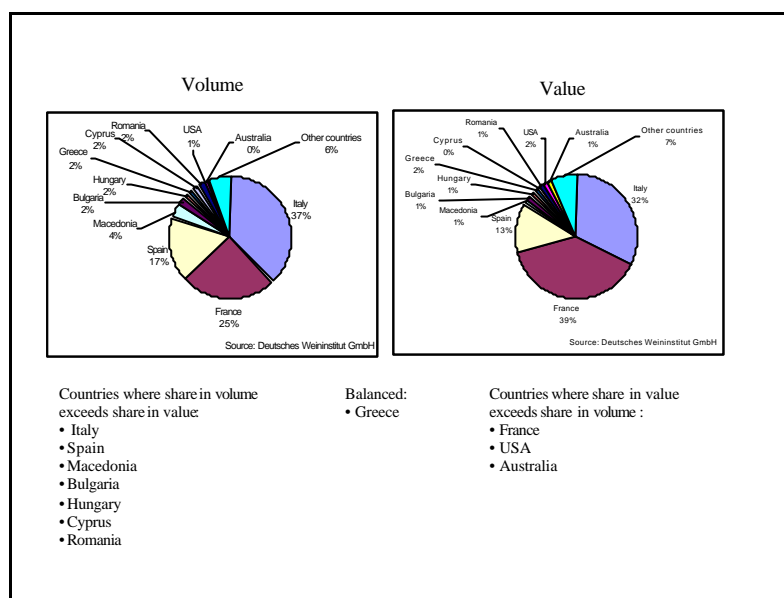
**Table 3: Quality composition of Germany's imports of wine, 1997-1999.**

Type of wine and country of origin	Wine imports			
	Volume	Share in Total	Value	Share in Total
	[1000 hl]	[%]	[Mio. DM]	[%]
All wines	12374	100	3518	100
EU	85%		89%	
non-EU	15%		11%	
Quality wine, white	1068	9	443	13
EU	100%		100%	
non-EU	0%		0%	
Quality wine, red	2206	18	1077	31
EU	100%		100%	
non-EU	0%		0%	
Table wine, white	3857	31	453	13
EU	90%		79%	
non-EU	10%		21%	
Table wine, red	3394	27	630	18
EU	64%		57%	
non-EU	36%		43%	

Source: BMELF 2000. Ertragslage Garten- & Weinbau, Übersicht 64.

The most important countries of origin of Germany's wine imports are Italy, France, and Spain. Together, the three countries account for more than three quarters of Germany's volume and value of wine imports. Imports from the US are still at a low level but the US, together with France and Australia, is one of the few countries whose share in import value exceeds its share in import volume of wine into Germany.

**Figure 11: Origins of wine imports by Germany (volume and value), 1998.**



## 2.7 Wine laws and regulations

The member countries of the EU translate EU orders into national laws and they may add laws and regulations where the EU choose to leave matters to the national jurisdictions. The important German national laws and orders relating to wine are the Wine Law of 1994 and the Wine Order of 1998. Federal laws may be complemented by laws of the states and a small number of special agencies assures their execution.

In addition to regulating the export and import of wine, the Wine Law and the Wine Order attempt to achieve four things:

- 1) to control the production of grapes and wine;
- 2) to assure quality standards for wine;
- 3) to protect wine consumers, and
- 4) to foster the marketing of wine.

We all are familiar with such sets of good intentions and have grown wary of the outcomes. However, I do not intend to discuss the effectiveness of these laws and regulations and I only report what the laws are supposed to achieve.

Control of the production of grapes and wine is attempted by

- limiting production to the specified 13 production regions in Germany and to land within these regions that is deemed suitable for producing a wine typical for the region;
- controlling new plantings and replantings of vineyards;
- specifying maximum average yield for the vineyards of a winery;
- prohibiting irrigation with the exception of irrigation of vineyards on steep slopes and rocky

- soils, and for frost protection, and
- by distilling surplus wine.

Two measures serve to maintain wine quality. The first is the specification of three quality levels:

- 1) table wine, with the subcategory "country wine";
- 2) quality wine from designated production regions ("Qualitätswein bestimmter Anbaugebiete" - QbA), and
- 3) quality wine with special attributes, where the attributes are "Kabinet", "Spätlese", "Auslese", "Beerenauslese", "Trockenbeerenauslese", and "Eiswein". The attributes are distinguished by the potential alcohol content of the wine, and the time and method of harvesting.

All quality wines must be analyzed chemically and undergo an organoleptic assessment which involves appraisal of their bouquet, taste, visual appearance, and of the "harmony" of taste and bouquet.

Wine that passes muster is given an official essay number that must be printed on the label of the bottled wine. Wine labeling has become a science of its own - everything is regulated down to the size of the print. The law also prohibits any label contents that are not specifically permitted.

Finally, in order to foster marketing of German wine, a "Wine Fund" is established by law with the mandate to promote the sales of German wine at home and abroad. The fund is financed from a levy on vineyard area (130,- DM/ha) and on wine sold in the market (13,- DM/t).

### **3 E-COMMERCE: CHARACTERISTICS AND INFRASTRUCTURE REQUIREMENTS**

The best definition of e-commerce that I know describes e-commerce as commercial transactions conducted on the Internet, nowadays most often on the World Wide Web. By using the Internet e-commerce leverages three capabilities of computers and digital networks:

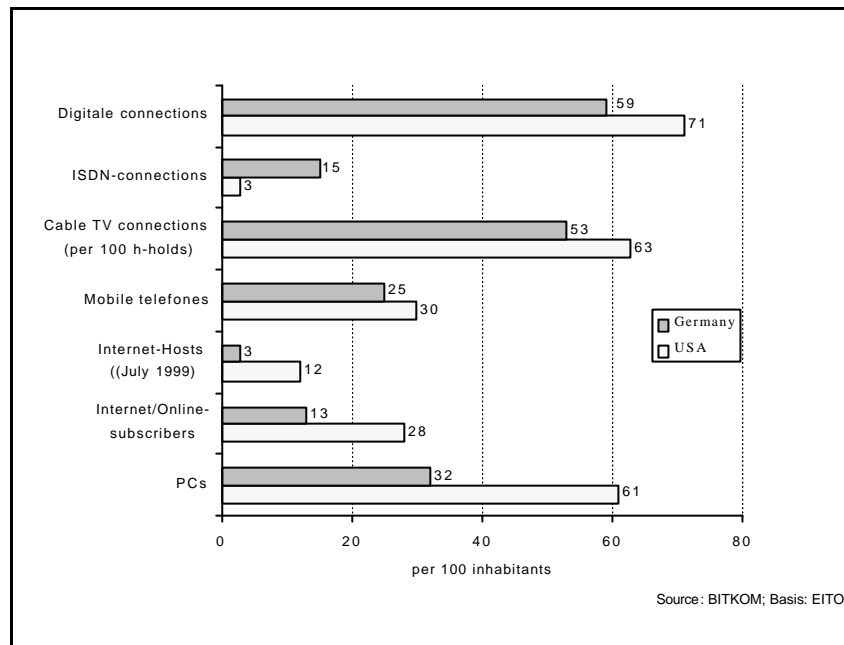
- (1) the ability to store and retrieve large amounts of data;
- (2) the ability to process data quickly and cheaply, including the ability to represent data in various ways, and
- (3) the ability to communicate data over long distances at a speed approaching the speed of light.

The technical capabilities of computer networks can be employed in many ways and with important economic advantages for adopters, such as:

- significant reductions in transaction costs;
- enormously increased range of communication;
- vastly increased reach or media richness of communications;
- potential cost savings from tight coordination based on automated information exchange between buyers and sellers;
- option to sell at all days and at any time of the day;
- buying in virtual privacy and personalization of services;
- collection and perhaps sale of customer data;
- ability to introduce new pricing schemes, such as volume pricing or price submissions;
- improved information about product quality and market prices, and
- markets can be re-intermediated by eliminating market intermediaries or replacing them with new ones.

For the benefits of e-commerce to be realized, a country or an industry must have invested heavily in digital infrastructure. Germany is lagging the USA in IT investments. There are more Internet host per 100 inhabitants in the US than in Germany, more Internet subscribers, more PCs, and more digital connections. The only aspect where Germany leads the US is in ISDN connections. How far Germany is behind the US is difficult to say. The general opinion is that Germany is about three years behind the US in IT and e-commerce adoption.

**Figure 12: Lagging IT-infrastructure deployment**



#### **4 COSTS AND BENEFITS FORM E-COMMERCE ADOPTION BY THE GERMAN WINE INDUSTRY**

Recently, members of Salomon, Smith, Barney wrote that "e-commerce may be the most important commercial force impacting the distribution of wine." For e-commerce to have a significant impact on the wine industry it will have to be adopted by the industry and by its customers. The decisions to adopt e-commerce, in turn, will depend on the balance of the benefits and costs to its adopters.

##### **4.1 Costs of e-commerce adoption and size of wineries**

To be able to participate in e-commerce with consumers a seller has to establish a web site. The costs of such sites depend on the type of information included and the functions provided by them. They are low for sites that only provide fixed information and no options for interaction with their users. Costs are high for sites that provide search and ordering capabilities and that can accept credit card payments. Even when a computer and an Internet connection is available, a web site suitable for e-commerce transactions costs several thousand DM to develop and some costs for its operation and maintenance. Most of the costs of e-commerce participation by wineries are, however, fixed costs.

Most wine growers in Germany operate less than 3 ha of vineyards and produce less than 30,000 l of wine per year. These small producers are severely constrained in their ability to recover the costs of a web site through increased sales. Larger producers with more than 5 ha of vineyards, who may be able to spread the costs of investment over a larger quantity of wine sold, are,

however, a minority in most wine growing regions in Germany. For example, only 20% of the grape producers in the Pfalz region operate more than 5 ha, in the Mosel region this group accounts for only 3%, and in Baden for only 1% of all grape producers. We therefore have reason to expect that e-commerce will be adopted mainly by larger producers who market a considerable proportion of their wine directly. Because the Pfalz has a large proportion of relatively large farms and a large share of wine from this region is sold directly, we can expect that e-commerce will be adopted early in this region.

We have some information about the web sites of wineries from the Mosel and Pfalz regions. Only a small proportion of wineries' web sites are simple sites that only provide information to their visitors and the majority is intended to also sell wine. However, few sites allow visitors to order wine on the web and to pay with their credit cards. Instead, ordering through email or fax and conventional means of payment dominate. Surprisingly, close to 20% percent of the sites also have pages in English.

**Table 4: Preliminary results of a survey of winery web sites, 2000.**

<u>Wineries surveyed</u>		N	<u>Classification of homepage</u>		N	%	
Mosel-Saar-Ruwer		49	Business card	6	6		
Pfalz		60	Inquiry kiosk	12	12		
<b>Total</b>		<b>109</b>	Web store without the opportunity to order	6	6		
Year when founded:	1299-1993		Web store with the opportunity to order by fax or email	72	71		
			Web store with the opportunity to order on the web	6	6		
			<b>Total</b>	<b>102</b>	<b>100</b>		
<u>Type of enterprise</u>		N	%	<u>Methods of payment</u>		N	%
Family owned		88	88	Credit card	6	8	
Cooperative		10	10	COD	43	54	
Commercial		2	2	Cash remittance	30	38	
<b>Total</b>		<b>100</b>	<b>100</b>	<b>Total</b>	<b>79</b>	<b>100</b>	
<u>Multilingual homepage?</u>		N	%	<u>Ordering options</u>		N	%
German		85	82	Email	48	61.5	
English and german		19	18	Fax, telephone	2	2.56	
<b>Total</b>		<b>104</b>	<b>100</b>	Shopping cart	28	35.9	
				<b>Total</b>	<b>78</b>	<b>100</b>	
<u>Searchfunction on site?</u>		N	%				
Yes		3	3				
No		106	97				
<b>Total</b>		<b>109</b>	<b>100</b>				

#### 4.2 Benefits from e-commerce

In contrast to many conventional technologies whose benefits do not depend on whether others also have adopted the technology, the benefits from e-commerce are only realized when both buyers and sellers adopt it. Hence, there may be a chicken-and-egg problem. However, the problem is not severe when we are concerned with e-commerce between wine sellers and consumers. Most likely, consumers' decisions to adopt e-commerce are not much influenced by the option to buy wine on the Internet.

The potential benefits from e-commerce adoption by the wine industry are many. E-commerce could contribute to reduce consumers' search costs in this highly fragmented industry with many small producers. Product differentiation is also very high but the disadvantages from not being able to taste wine on the Internet are alleviated by the well established and rigidly enforced system of classifying and describing wine. Furthermore, the considerable price spread between prices paid for wine that is marketed directly and for wine sold in wine shops suggests that consumers are prepared to pay for complementary services. Possibly, some of these services

involve information that may be provided by the wineries themselves over the Internet.

### 4.3 Target groups

Wineries can only capture the benefits from e-commerce adoption when their customers have access to the Internet. A comparison of the composition of wine drinkers by gender and by age shows that some customer groups are better wired than others. In particular, proportionately more male wine drinkers are Internet users than female wine drinkers and a larger share of young wine drinkers has access to the Internet than wine drinkers of age 50 and above. However, as the Internet continues to spread in the population at large, these differences are likely to fade away.

**Table 5: Characteristics of wine drinkers and wine drinking Internet users, Germany, 2000**

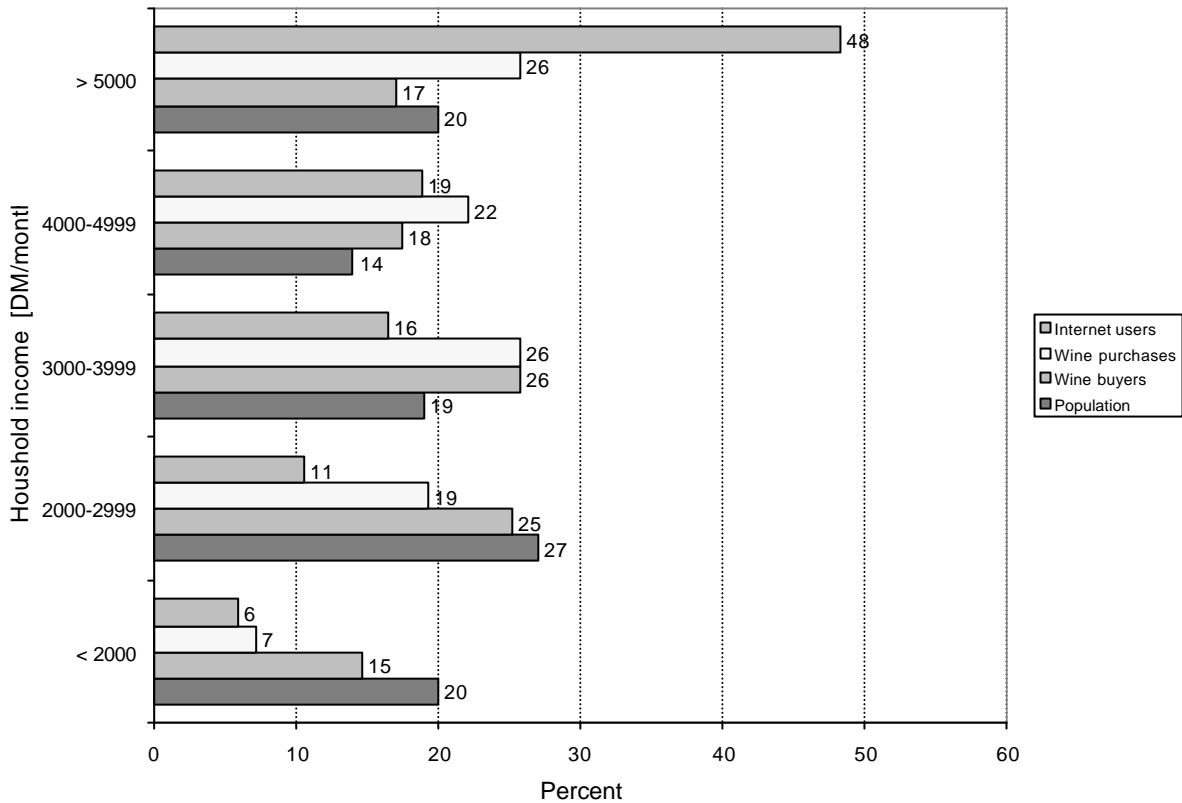
	Total sample	Wine drinkers*	Wine drinking Internet users
Sample size	12186	5350	1430
Gender [%]			
Male	48	40	64
Female	52	60	36
Age in groups [%]			
14-19 Jahre	8	3	11
20-29 Jahre	14	12	25
30-39 Jahre	19	19	26
40-49 Jahre	16	20	22
50-59 Jahre	16	20	13
60-69 Jahre	14	14	3
70-99 Jahre	14	13	1
Profession [%]			
Independent/ free	7	10	13
Employee/ public servant	49	61	55
Worker/craftsman	31	21	11
Full-time farmer	1	1	0
Other	12	8	21

\* drink wine at least once a month

Source: Verbrauchs- und Medienanalyse (VuMA)/ ARD-Werbung, RMS, ZDF-Werbefernsehen, 2000

The economic characteristics of the Internet users are more likely to persist than the demographic ones. At present, Internet access and household income are clearly correlated: the higher the household income the higher also is the proportion of people having access to the Internet. Wine purchases and the proportion of people buying wine are also correlated with household income and a large proportion of households with high incomes buy wine and are Internet users.

**Figure 13: Wine buyers, wine purchases, and Internet users by household income class, Germany, 1999/2000.**



## 5 WHAT NEXT?

Obviously, we are still in the very early stages of our research. The central questions that we will pursue during the next stages of this project are six:

(1) How widely has e-commerce been adopted in the wine industries?

The extend to which the wine industries have already embraced e-commerce is not known. Taking the web site as an indicator of e-commerce participation, we will estimate the number of e-commerce wineries and wine industry intermediaries for California and major wine growing areas in Germany.

(2) How can e-commerce be modeled for the various stages of the wine industry?

To guide description and explanation of e-commerce practices a theoretical framework is required that reflects important economic factors for e-commerce adoption and diffusion.

(3) Can the way in which wineries participate in e-commerce be classified into economically meaningful categories?

Guided by the e-commerce models and using insights from empirical studies of web site contents and design we will classify the websites of wineries into economically meaningful categories of e-commerce participation.

(4) Can successful e-commerce strategies of individual wineries and wine market intermediaries be identified and how do these strategies vary among wineries and intermediaries?



(5) What e-commerce practices improve the competitiveness of the industry?

Using the e-commerce market models we will identify e-commerce practices that are likely to improve the competitiveness in export markets.

(6) What are the implications of the empirical results and insights gained from studying e-commerce practices and impacts in the wine industry for other agricultural industries?

## Appendix: A brief description of the wine growing areas in Germany

The Ahr is one of Germany's northernmost wine regions. It is also one of the smallest, with vineyards extending only 24 km or 15 miles along the Ahr River. Four fifth of the wine produced at the Ahr are red, mostly Portugieser, with Dornfelder on the rise. Among the whites Riesling and Müller-Thurgau dominate production.

The Mittelrhein region extends for about 100 km or 60 miles along the Rhine river. The area is prime tourist country, complete with steep, terraced vineyards, medieval castles, many in shambles, and "Weinstuben" reeking of "Gemütlichkeit". Nearly three-fourths of the vineyards are planted with the Riesling. In years with unfavorable weather and when the wines from this region are acidic, they are sold to the producers of Sekt, Germany's sparkling wine, in which acidity is an asset.

The Rheingau between Wiesbaden and Rudesheim is one of the most distinguished wine regions of the world and it is the home of what the English called "Hock", i.e. wine from Hochheim which Queen Victoria cherished. Two grape varieties Riesling and Spätburgunder dominate. The regions' wine makers are credited for having recognized in the 18th century the value of harvesting the crop at various stages of ripeness - from which the "Prädikate", i.e. quality classes, evolved. The area also is home of Germany's only specialist oenological college Geisenheim.

The Mosel-Saar-Ruwer region comprises the Mosel valley and some parts of the valleys of its tributaries. Here viticulture exploits the steep slopes, some are 70° steep, to better expose the vines to the scarce sunlight. That practice increases labor requirements considerably. The Mosel-area produces light and rather pale whites, mostly Riesling. Some of the most expensive German wines are produced here, e.g. by Egon Müller at Wiltingen whose Trockenbeerenauslese and Eiswein regularly fetch several thousand Marks per bottle at auction.

The Nahe is one of the smaller German wine regions. The area comprises many different soil types making it a dorado for true believers in "terroire"-philosophies of wine quality. Riesling dominates, followed by Müller-Thurgau and Silvaner. Red wine was rarely produced in the region but some wine makers have presented in the last few years pleasant red wines too.

Rheinhessen is Germany's largest wine region in terms of area harvested. The region is home of Liebfraumilch, a pleasant wine from a small vineyard that unfortunately found too many poor imitators. In the past, wine makers from Rheinhessen have contributed much to the poor reputation of some German wines by producing large volumes of cheap wines of unimpressive quality. By abandoning new varieties in favor of Riesling and by emphasizing quality over quantity a new generation of wine makers, many of whom have studied at Geisenheim, are now struggling to shed the old, unfavorable image. (Rheinhessen also was home of Herbert Simon's paternal forebears who were wine merchants in the area.)

Bordering on Rheinhessen in the north and France in the south and west, the Pfalz is Germany's second largest wine region in terms of area under grapes, but in many years produces the largest harvest. Dominant varieties here are Riesling, Müller-Thurgau, Kerner, and Silvaner. Recently, the area with Dornfelder grapes has increased considerably as wine makers try to exploit the trendy demand for red wine.

The tiny region Hessische Bergstrasse produces white wines, mostly Riesling and Müller-Thurgau, that are similar to the whites from the Rheingau.

Baden, the southernmost of Germany's wine regions, is a 400 km or 240 mile long, slim strip of vineyards located between Black Forest and the Rhine River. Nearly half of the vineyards are planted with Burgunder (Pinot) varieties: Spätburgunder (Pinot Noir), from which Weissherbst (rosé) is made, Grauburgunder (Pinot Gris) which is often marketed under the synonym "Ruländer" to denote a richer, fuller-bodied (and sweeter) style; and Weissburgunder (Pinot Blanc).

With more than half of its vineyards planted with red wine varieties, Württemberg ranks as Germany's premier red wine region. The main variety is Trollinger, seldom found outside of this region, followed by Schwarzriesling, also known as Müllerrebe or Pinot Meunier, and Lemberger. Riesling is an important variety in Württemberg, accounting for nearly a quarter of the vineyard area, followed by Kerner and Müller-Thurgau.

Franken, and its center Würzburg, is located in the north of Bavaria. Most of its vineyards are planted on the slopes of the Main River and its tributaries. Because of the region's high annual rainfall, short and cool autumns, early frosts, and cold winters the late-ripening Riesling plays a minor role and Müller-Thurgau (also called Rivaner), Silvaner and new crossings, such as Bacchus and Kerner, are the most important white varieties. Red grapes thrive in the western portion of the region. The better Franken wines are traditionally bottled in a Bocksbeutel, a bottle with a plumb round body that is not used in any other region in Germany.

The Saale and Unstrut area located in the east of Germany is among Europe's northernmost wine regions. To compensate for its marginal climate, wine is grown on labor-intensive terraces. Yields are generally low and Spätlese or Auslese can be produced only in exceptionally warm years.

Sachsen is Germany's easternmost and smallest wine growing region. Most of its vineyards are located in the vicinity of Dresden.