

Chapter IV. Electronic commerce

Only a few years ago, internationally comparable official statistics measuring the level, growth and composition of electronic commerce transactions were not available. Today national statistical offices are gradually implementing OECD definitions and guidelines for measurement in this area. While comparisons still need to take into account differences in the type of definition used in surveys and in their coverage (see Box 4.1 and Annex 4), available data show some interesting patterns.

To date, the Internet is still mainly used for marketing purposes. Its use for other purposes varies according to the business's position in the value chain, with, on average, twice as many businesses using Internet for purchases as for sales.

Aggregate patterns hide sector-specific and size-specific differences in the propensity to carry out transactions. Overall, however, Internet transactions still account for a very small share of total sales, mainly take place among businesses and are largely domestic.

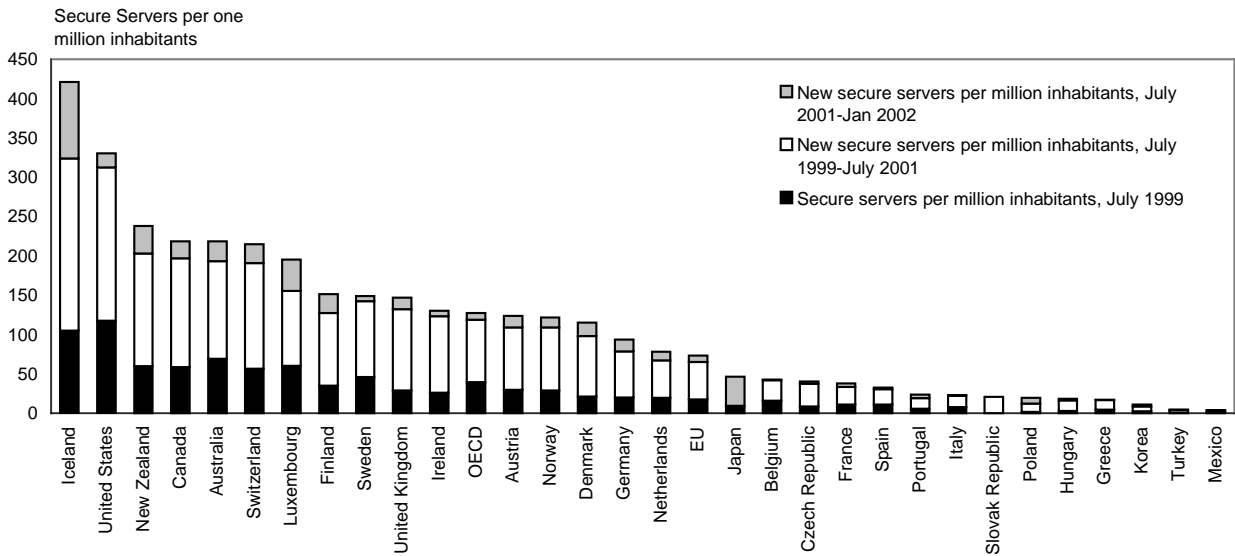
To help explain differences in the rate of e-commerce uptake across countries, this chapter also relies on indicators of barriers to Internet commerce. As noted in Chapter 3, data on barriers are qualitative in nature and need to be used with caution when making international comparisons.

Infrastructure for Internet commerce

- The number of secure servers provides one indicator of a country’s infrastructure for Internet commerce. This indicator, based on Netcraft’s Secure Socket Layer (SSL) surveys, measures the number of servers with a secure software commonly used for purchasing goods and services or transmitting privileged information over the Internet.
- Over the period July 1999-January 2002, the number of secure servers in OECD countries

increased by 223%. In January 2002, the United States had 65% of the total OECD-area secure servers; the United Kingdom was second with over 6%. Also at that time, Iceland recorded the most intensive use, with 421 secure servers per million inhabitants, followed by the United States with 330. Other countries above the OECD average of 127 per million inhabitants were New Zealand (238), Canada and Australia (218), Switzerland (215), Luxembourg (195), Finland (151), Sweden (149) and Ireland (130).

Internet commerce developments measured by the number of secure Web servers



Source: OECD and Netcraft (www.netcraft.com), August 2002.

Measuring electronic commerce transactions

- Few countries currently measure the value of Internet or electronic sales (see Box 4.1). Total Internet sales in 2000 ranged between 0.3% and 2% of total sales, while electronic sales (including those over all computer-mediated networks) reached 13% in Sweden. The share of Internet sales has been increasing in Canada (from 0.2% in 1999 to 0.5% in 2001), but has remained stable in Denmark (0.9% in both 2000 and 2001).
- The distribution of Internet sales in European countries shows some interesting patterns. In the case of Sweden, the country with the highest share of e-commerce sales, only about 11% of larger businesses had more than 5% of sales originating from Internet sales in 2000. For smaller businesses the distribution of Internet sales is flatter; in Sweden only over 11% of smaller businesses have a share of Internet sales above 1%, compared to over 19% in the case of larger businesses.

Box 4.1. Measuring electronic commerce: OECD definitions of Internet and electronic transactions

Only a few years ago, internationally comparable official statistics measuring the level, growth and composition of electronic commerce transactions were not available. In April 2000, OECD member countries endorsed two definitions of electronic transactions (electronic orders), based on narrower and broader definitions of the communications infrastructure (see Annex 4). According to the OECD definitions, it is the method used to place or receive the order, not the payment or the channel of delivery, that determines whether the transaction is an Internet transaction (conducted over the Internet) or an electronic transaction (conducted over computer-mediated networks). In 2001, the OECD developed guidelines for interpreting the definitions of electronic commerce and encouraged member countries to take such guidelines into account when developing their questionnaires (see Annex 4).

To date, comparisons still need to take into account differences in the type of definition used in surveys and in their coverage. The United States, for example, does not produce economy-wide estimates and uses a broad definition that includes sales over "Internet, extranet, electronic data interchange (EDI) or other on-line systems". Australia and Canada have similar definitions and coverage of Internet transactions, while figures for some countries do not include the financial sector (see below).

Official estimates of Web, Internet and electronic commerce transactions,¹ 2000 or latest available year

Percentage of total sales or revenues

	Web commerce	Internet commerce	Electronic commerce
Business sector ²	2.0% Sweden	1.8% United Kingdom 1.4% Spain 1.0% Austria 0.5% Luxembourg 0.4% Portugal 0.5% Canada (2001) 0.7% Australia (2000-2001) 0.3% New Zealand (2000-2001)	13.3% Sweden 7.9% Finland 5.2% UK 4.0% Spain 2.5% Austria 1.8% Portugal 0.5% Luxembourg
Business sector ² (excluding financial sector)	0.9% Denmark (2001) 0.7% Finland	2.0% Norway (2001) 0.9% United Kingdom 0.4% Italy	10.0% Norway (2001) 9.1% Finland 6.0% United Kingdom 6.0% Denmark (2001) 1.1% Italy
Retail sector	0.1% (France, 1999)	1.0% United Kingdom 0.6% Canada (2001) 0.4% Australia (2000-2001) 0.2% Austria	1.4% United Kingdom 1.2% (United States, 2nd Q 2002) 1.3% (United States, 4th Q 2001) 1.0% (United States, 2nd Q 2001) 0.2% Austria

1. See Annex 4 for a discussion of these definitions.

2. Data for Austria, Italy, Luxembourg, Portugal, Spain and Sweden exclude NACE activity F (construction).

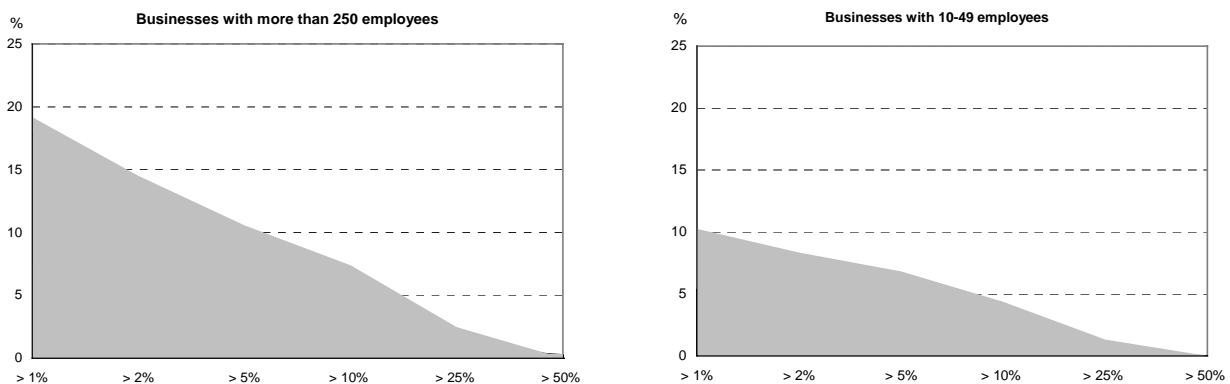
Source: OECD, ICT database, August 2002; Eurostat, *E-commerce Pilot Survey 2001*.

Internet and electronic commerce transactions

- The Internet is still mainly used for marketing purposes and its use for other purposes varies according to the business's position in the value chain (customer or supplier). For 16 countries for which both Internet purchasing and Internet sales data are available, purchasing is more common than selling. Except in Greece and Luxembourg, 63-93% of businesses with more than ten employees reported using the Internet. However, only one in eight on average reported making Internet sales. On average, twice as many businesses use Internet for purchases as for sales.
- Among firms that use the Internet, only a few distribute goods and services on line or offer interactive electronic payment capability. An analysis of the use of computer networks in US manufacturing plants in mid-2000 revealed very limited use of Internet applications to integrate transaction-related business processes. Some plants that do not accept on-line orders accept on-line payments, while some plants that reported no on-line orders provided on-line customer support. About 34% of manufacturing plants reported having purchased on line, while only 9% paid on line. Although firms may not pay on line for security reasons, 29% of those that did, did not purchase on line (US Department of Commerce, 2001). In European countries, up to 8% of businesses delivered digitised products and/or received payments over the Internet in 2000.
- The relation between Internet use and size is a complex one. Not only is business size industry-specific, *i.e.* what may be a small enterprise in one industry may be a large one in another, but Internet use for transactions is industry-specific as well. Data broken down by class size show that smaller businesses that use the Internet appear to have roughly the same propensity to sell over the Internet as larger ones in Australia, Denmark and Sweden. Use of the Internet for purchases seems to be more sensitive to firm size across all countries.
- The propensity to carry out Internet purchases and sales is higher in services than in manufacturing, and financial services, business services and wholesale trade are generally the most intensive users. Internet orders are most frequent in the finance and insurance industry in Australia, Norway, Spain, Sweden and the United Kingdom, and the business services industry also has high rates of Internet commerce. In Denmark and Finland, the business services industry reported approximately every second order to be an Internet order. In Australia, Canada, the Netherlands and New Zealand, the propensity to buy or sell over the Internet seems to be more equally distributed across sectors.

Distribution of e-commerce sales in European countries, 2000

Percentage of businesses for any given country whose sales over the Internet as a share of total sales are higher than 1%, 2%, 5%, 10%, 25% or 50% in larger and smaller businesses

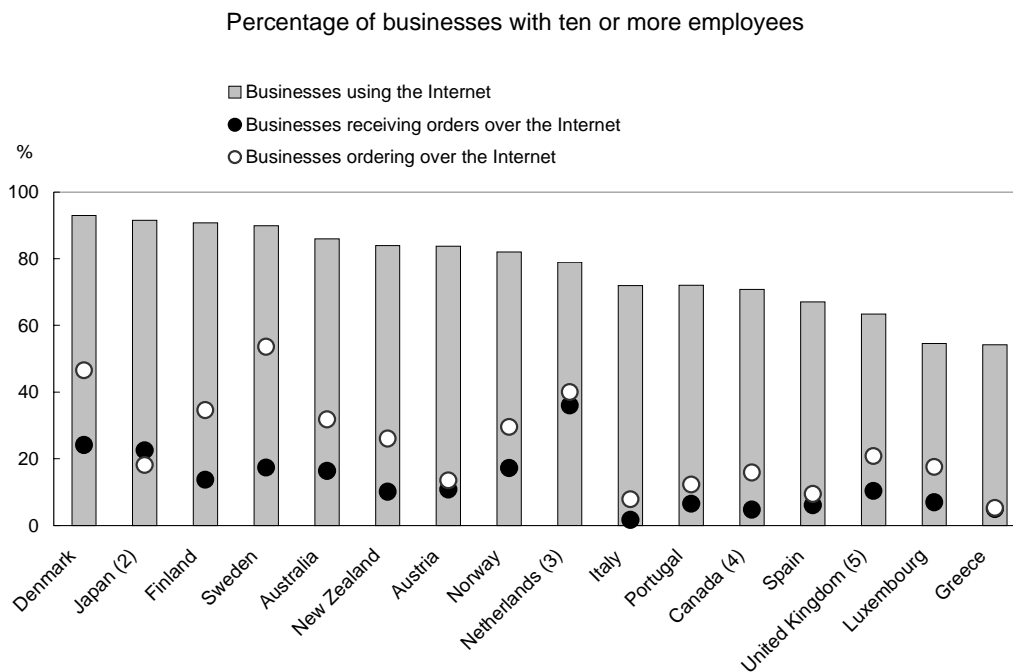


The shaded area represents Internet sales distributions in European countries for every Internet sales interval. In the case of larger businesses a maximum of 10.6% of businesses (in Sweden) had more than 5% of sales originating from Internet sales in 2000, while a maximum of 1.2% of businesses (in Denmark) had Internet sales whose value was more than 50% of overall sales. In the case of smaller businesses the distribution of Internet sales is flatter with over 11% of businesses only having a share of Internet sales greater than 1%, compared to over 19% in the case of larger businesses (in Sweden).

Source: OECD, based on Eurostat, *E-commerce Pilot Survey 2001*.

Internet and electronic commerce transactions

Businesses using the Internet for purchasing and selling, 2001¹



Note: The results of the Eurostat survey are based on a selection of industries which changes slightly across countries. The main sectors covered are manufacturing, wholesale and retail trade, hotels and restaurants, transport, storage and communications, financial intermediation, real estate, renting and business activities. The surveys of Denmark, Italy, Finland and Norway do not cover financial intermediation; those of Denmark, the Netherlands, Finland, the United Kingdom and Norway also cover construction; Denmark and Norway also survey personal services.

1. Beginning of 2001 for Internet use, purchases and sales refer to 2000, except for Canada where purchases and sales refer to 2001 and for Denmark and Norway where Internet use refers to 2002 and purchases and sales refer to 2001.

2. All businesses with 50 and more employees.

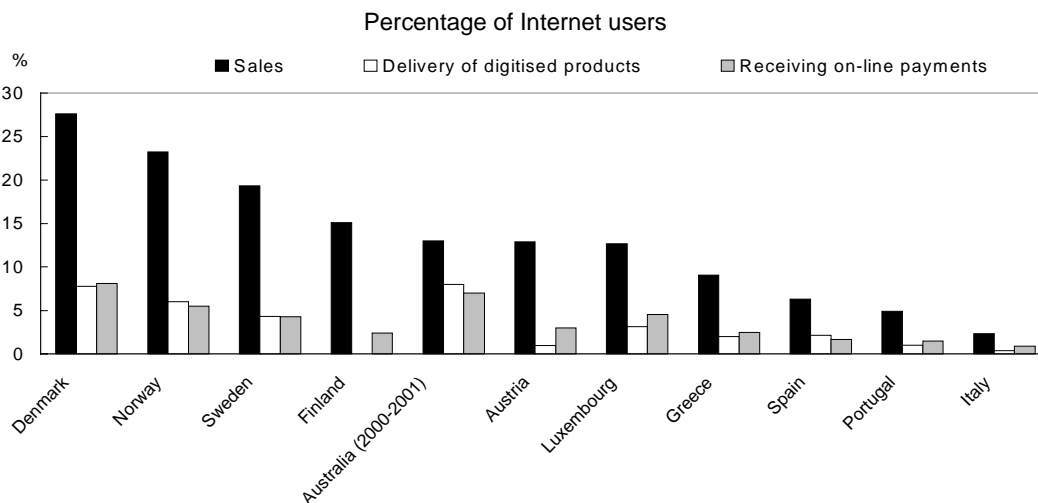
3. Use, orders received and placed refer to Internet and other computer-mediated networks.

4. All businesses.

5. Orders received and placed over the Internet and other computer-mediated networks.

Source: OECD, ICT database, August 2002; Eurostat, *E-commerce Pilot Survey 2001*.

Selling, delivering and paying over the Internet, 2000

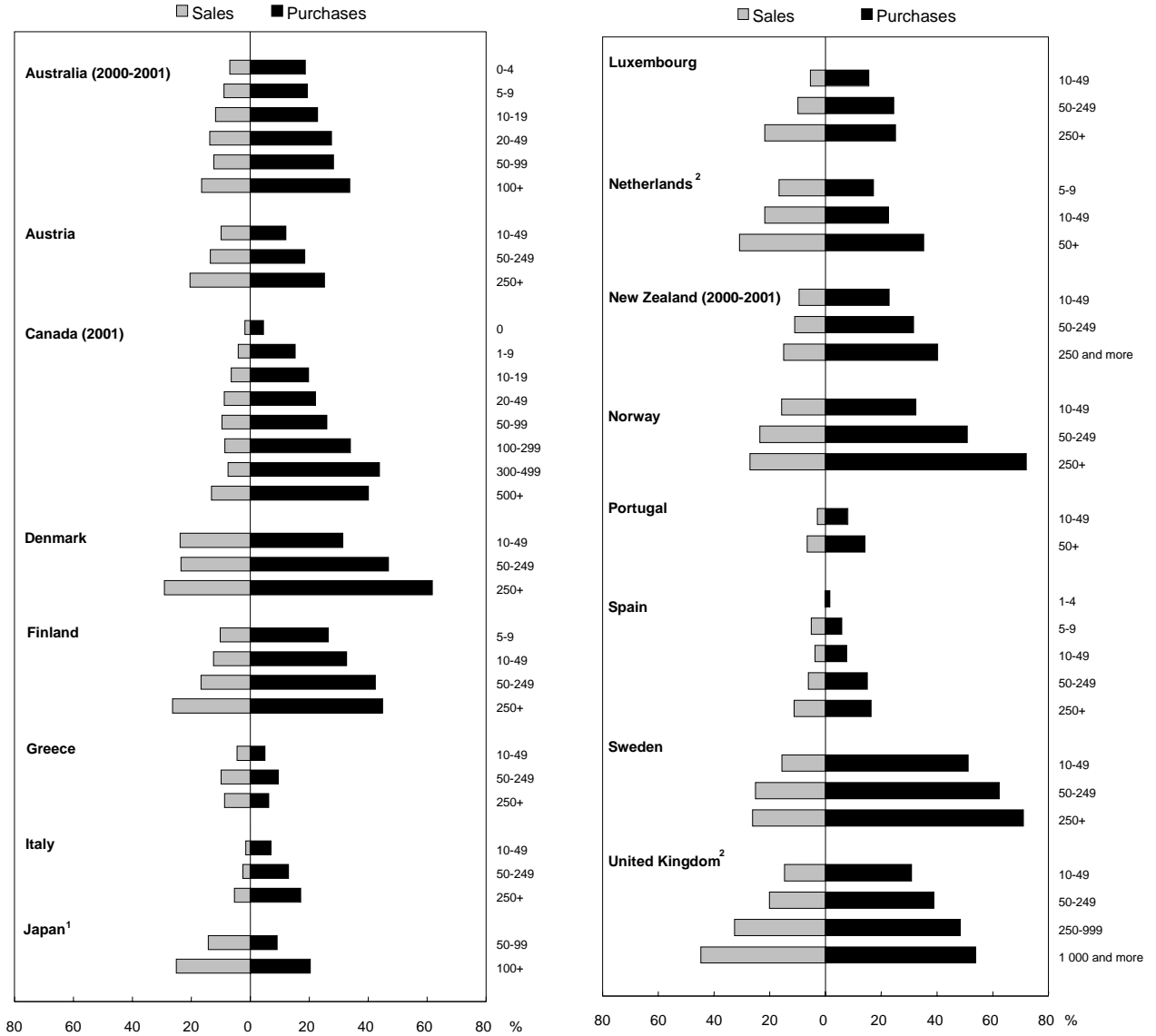


Source: OECD, ICT database, August 2002; Eurostat, *E-Commerce Pilot Survey 2001*.

Internet and electronic commerce transactions

Internet purchases and sales by size class, 2000

Percentage of businesses in each size class



1. All businesses with 50 or more employees.

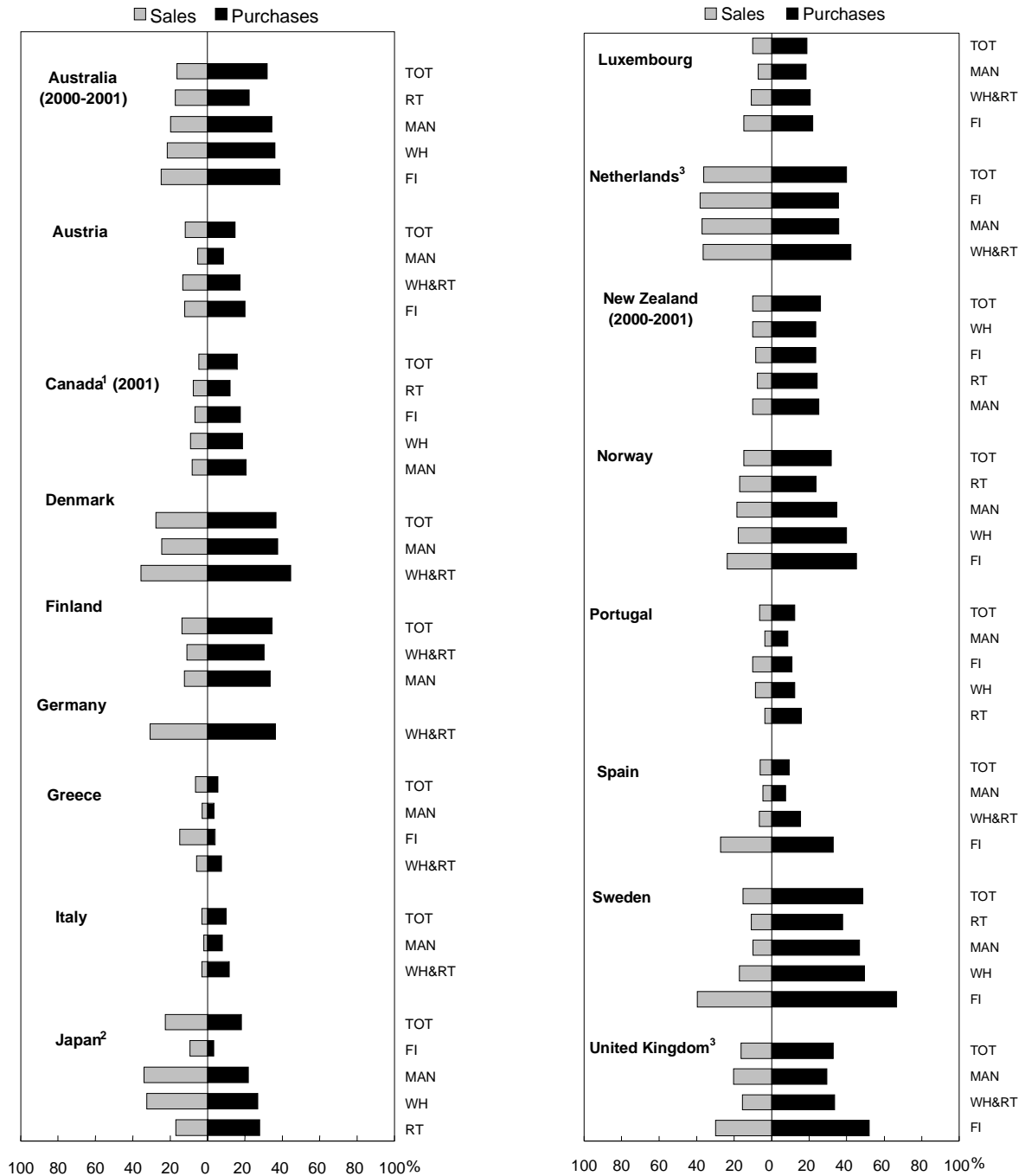
2. Orders received or placed over the Internet and other computer-mediated networks.

Source: OECD, ICT database, August 2002; Eurostat, *E-Commerce Pilot Survey 2001*.

Internet and electronic commerce transactions

Internet purchases and sales by activity, 2000

Percentage of businesses in each activity class



Note: TOT (total economy); FI (finance and insurance); RT (retail trade); WH (wholesale trade), MAN (manufacturing).

1. All businesses.

2. Businesses with 50 or more employees.

3. Orders received or placed over the Internet and other computer-mediated networks.

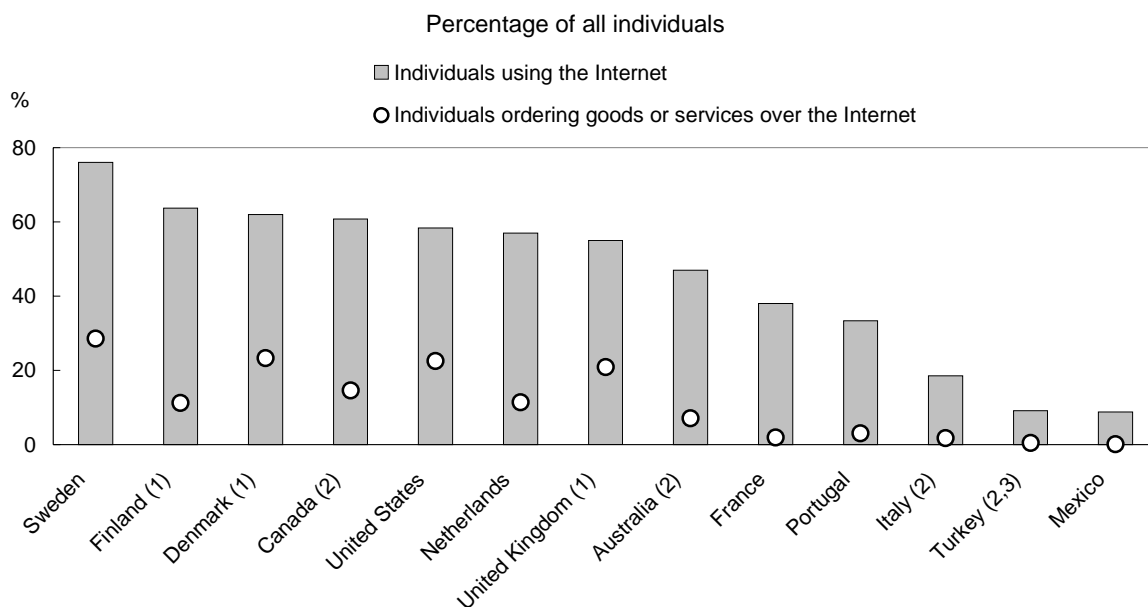
Source: OECD, ICT database, August 2002; Eurostat, *E-commerce Pilot Survey 2001*.

Internet and electronic commerce transactions by consumers

- Although transactions among businesses represent the bulk of electronic commerce, most attention has focused on business-to-consumer Internet sales. Since household expenditure in OECD countries typically accounts for over half of total domestic demand, this is not surprising. Moreover, the growing interest of policy makers in issues such as consumer trust and privacy protection in the on-line environment has raised demand for indicators of consumers' on-line transactions.
- The share of Internet users buying over the Internet is generally quite low and varies widely. It is highest in Denmark, Sweden, United Kingdom and United States, where about 38% of individuals using the Internet ordered products in 2001, followed by Canada (24%) and the Netherlands (20%). It is lowest in Mexico, where only 0.6% of Internet users purchase over the Internet. With about one in six Internet users purchasing goods over the Internet in Finland and Australia, there is still a potential for a marked increase in Internet sales, especially since over 50% of households in those countries has access to a computer.
- Some countries have started to collect statistics on the proportion or volume of business-to-consumer Internet transactions. Generally, less than 30% of Internet sales are to households, although the share varies considerably, ranging from about 30% in Finland and Luxembourg to only a little over 1% in Singapore in 2000 (Infocomm Development Authority, 2000). In the United Kingdom, the financial sector accounts for most Internet sales to households; if these sales are excluded, household Internet sales drop from 0.36% to 0.1%. In Canada, the finance and insurance sector accounted for 8% of total business-to-consumer transactions in 2001. Retail enterprises had the largest volume of transactions to consumers (30%), followed by wholesale trade (19%) and transportation and warehousing (13%). Manufacturing enterprises had the largest share of business-to-business Internet transactions (22%).
- As it is difficult to estimate business-to-consumer electronic transactions, retail transactions over the Internet are often used as proxies. The Canadian e-commerce survey, which produces estimates of Internet business-to-consumer transactions across all sectors of the economy, shows that only about half of Internet sales in the retail sector go to consumers. Internet retail sales are still a very small share of total retail trade sales, ranging from 0.1% in France to just over 1% in the United Kingdom. Retail sales in Canada doubled from 1999 to 2000, with the average value of an Internet sale remaining relatively unchanged at CAD 121 (USD 75) (Statistics Canada, 2001).
- The US Department of Commerce has published quarterly data on on-line retail sales since the last quarter of 1999. Internet retail trade grew rapidly both in volume and as a share of total retail trade in 1999-2001; its share increased from 0.70% in the fourth quarter of 1999 to 1.2% in the fourth quarter of 2000 and to 1.3% in the fourth quarter 2001. E-commerce retail sales in the second quarter of 2002 accounted for 1.2% of total sales, a decrease from the 1.3% of the previous quarter but an increase over the 1.0% of the second quarter 2001. The total value of on-line retail sales (USD 35.9 billion in 2001) should be considered as a lower bound, as certain categories that are included in other surveys, such as on-line travel services, financial brokers and dealers and ticket sales agencies, are excluded.

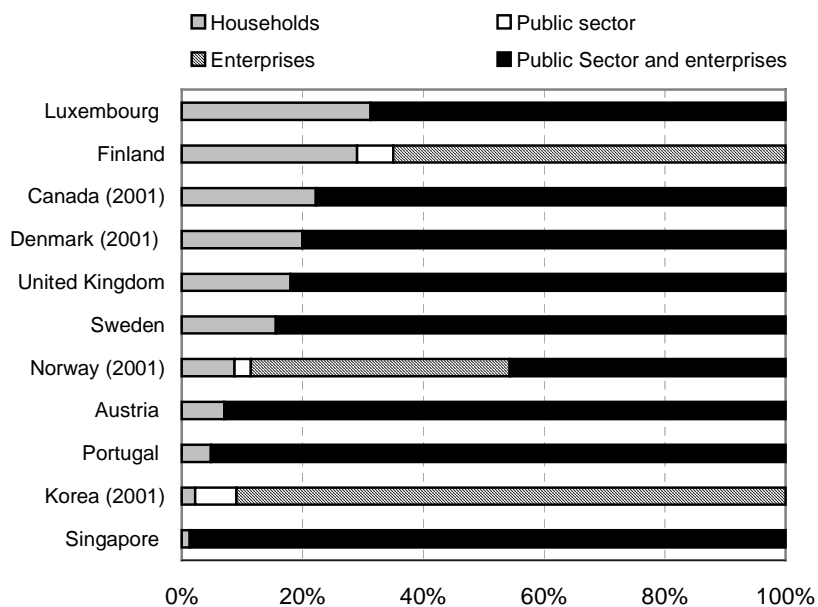
Internet and electronic commerce transactions by consumers

Individuals purchasing over the Internet, 2001 or latest available year



- 1. 2002 instead of 2001.
 - 2. 2000 instead of 2001.
 - 3. Individuals belonging to households in urban areas.
- Source: OECD, ICT database, August 2002.

Share of Internet sales by type of customer, 2000 or latest available year

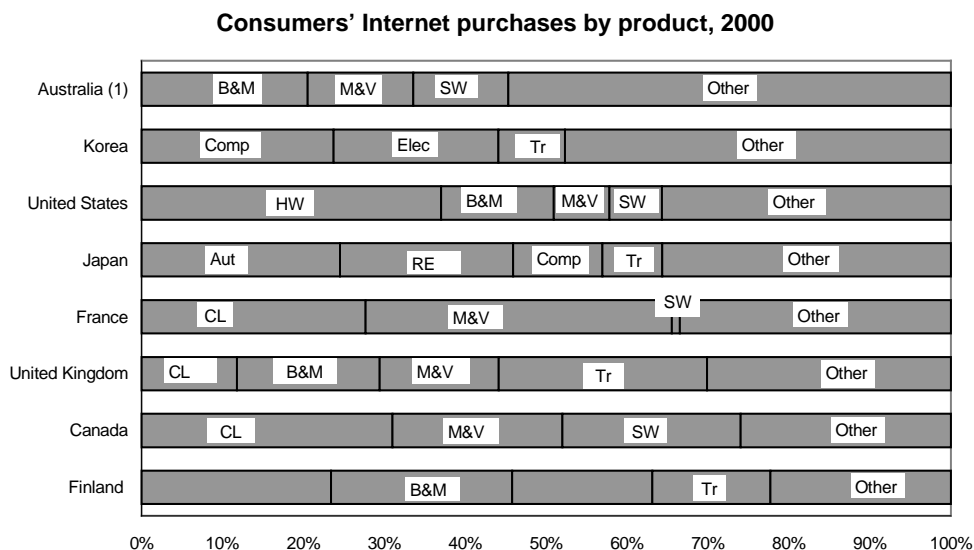


Source: OECD, ICT database, August 2002; Eurostat, *E-commerce Pilot Survey 2001*.

Internet transactions by product and cross-border

- The products that sell the best over the Internet are not necessarily the same across countries, since they reflect not only the nature of the product – digitised products such as music, books and software are easier to sell and distribute over the Internet – but also consumer tastes and habits.
- Computer products represent the biggest shares in the United States, Japan and Korea. In France, clothing accounts for about 30% of consumer purchases over the Internet. Digitised products such as music, computer software and magazines also represent a relatively important source of revenue. In 1999 in France, CDs and DVDs were the top-selling items over the Internet and represented almost 40% of the total value of Internet sales. In the Netherlands in 2000, CDs made up 23% and DVDs a further 4% of Internet sales (*De digitale economie 2001*). In Australia, three products (books, music and computer software) accounted for 45% of household spending over the Internet.
- Statistical offices have started to collect statistics on the share of firms' turnover originating from sales abroad. Such statistics are hard to collect at present, mainly because the volume of sales abroad may not yet be statistically significant. It is also difficult to identify where buyers and sellers are physically located. In Australia, 90% of businesses with a Web site have a site hosted only in Australia; 5% have a site hosted only overseas and the remaining 5% have a site hosted both in Australia and overseas (Australian Bureau of Statistics, 2000).
- Available statistics show that Internet sales are mainly domestic. To understand why, it is necessary to break down sales by industry, destination and type of customer (business or household). In Canada, for example, professional, scientific and technical services are most likely to have Internet sales to customers outside Canada, with 56% of the total value of their Internet sales abroad. In the accommodation and food services industry and the arts, entertainment and recreation industry more than 50% of the value of Internet sales were also to customers abroad. Overall in Canada, manufacturing, transport, wholesale trade and retail trade accounted for 60% of total Internet sales in 2001. In sum, while 16.6% of total Internet sales are to customers outside Canada, their industry composition is highly skewed. Wholesale trade and retail trade account for over a quarter of Internet sales, but their propensity to export is low, at 13.6% and 3.2% of all sales, respectively.
- In Eurostat's *E-commerce Pilot Survey*, sales abroad are broken down by destination within and outside Europe. Initial results for nine European countries indicate that European companies mainly sell over the Internet to locations within Europe. This may partly reflect the overall (intra-Europe) tendency of European trade. In Austria, Denmark and Finland, exports to Europe represent between 55% and 63% of total exports of goods. This roughly coincides with the ratio of intra-European Internet exports to total exports in Finland (56%) and Denmark (63%), while it is a bit higher for Austria (73%). The share of international Internet sales is particularly small in the United Kingdom, at only 0.05% of total sales in the sectors surveyed; the air transport industry has the highest propensity to export abroad, with 0.7% of total sales (ONS, 2001).
- The available data do not allow for breaking Internet exports down by type of customer to know whether business-to-consumer Internet transactions are more "international" in nature than business-to-business transactions. It is also difficult for consumers to know where a firm or a Web site is physically located, or whether a firm's location and that of its Web site coincide. Moreover, even if business-to-consumer transactions have a higher propensity to be "international", Internet sales in volume terms are more likely to be domestic, owing to the weight of business-to-business transactions.
- Statistics on international Internet purchases drawn from household surveys or surveys of individuals might help but rarely exist as yet. In Australia, 50% of adults purchasing over the Internet buy only from Australian Web sites, 32% only from overseas Web sites and 18% from both. Singapore reports that business-to-consumer sales are dominated by overseas customers, with particularly large shares of customers in Malaysia, Thailand, Japan and the United States (Infocomm Development Authority, 2000).

Internet transactions by product and cross-border

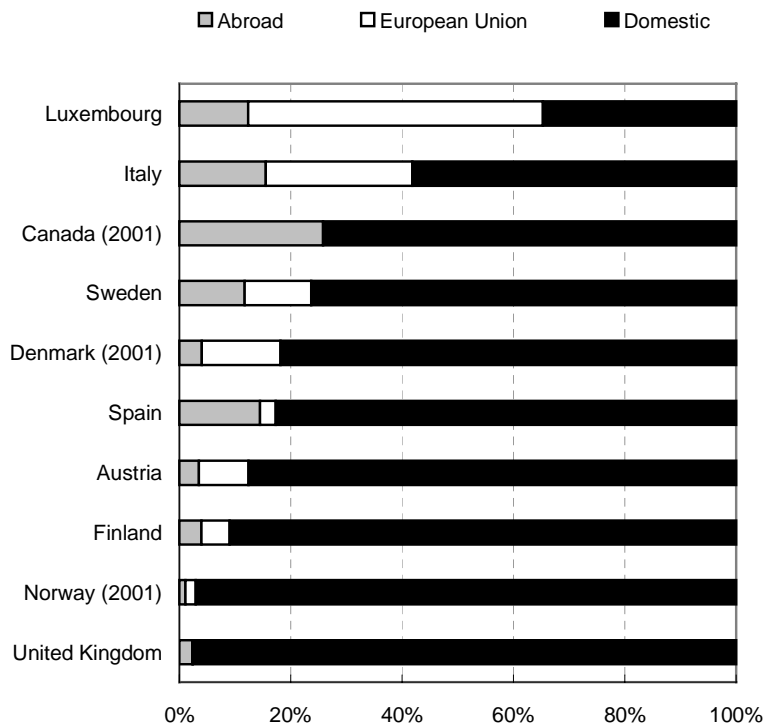


Note: Aut (Automotive); Comp (Computer and related products); CL (Clothing/ jewellery/ accessories); M&V (Music and videos); Elec (Electronic telecommunication equipment); RE (Real estate); HW (Computer hardware); B&M (Books/magazines); SW (Computer software); Tr (Travel).

1. Proportions of all adults purchasing or ordering over the Internet for private use.

Sources: ABS, 2001; Statistics Canada, 2000; INSEE, 2001; Statistics Finland, 2001; ECOM in collaboration with the METI, Japan, 2001; Korea National Statistical Office, 2001, US Bureau of the Census, 1999.

Share of Internet sales in domestic and international markets, 2000 or latest available year



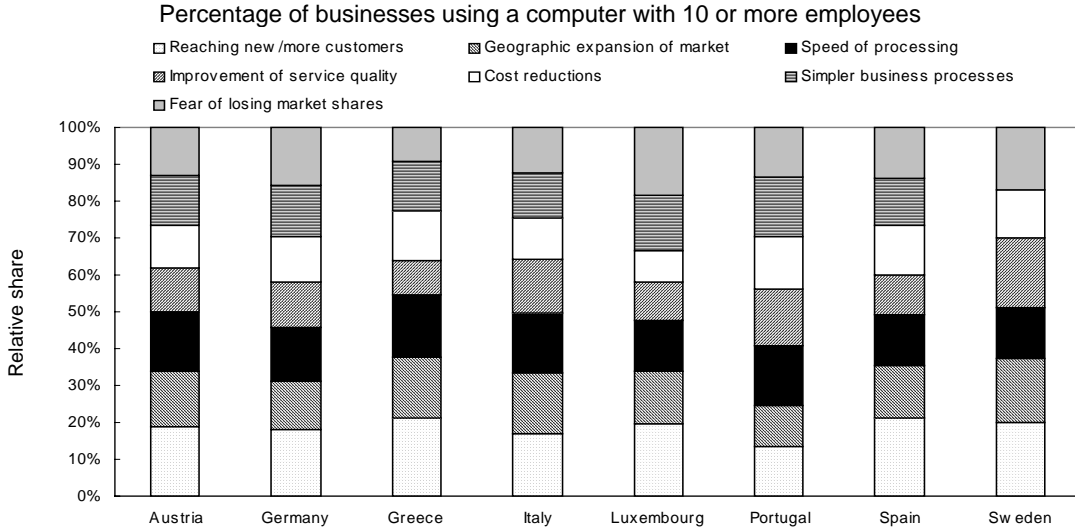
Source: OECD, ICT database, August 2002; Eurostat, *E-commerce Pilot Survey 2001*.

Drivers and inhibitors of Internet commerce

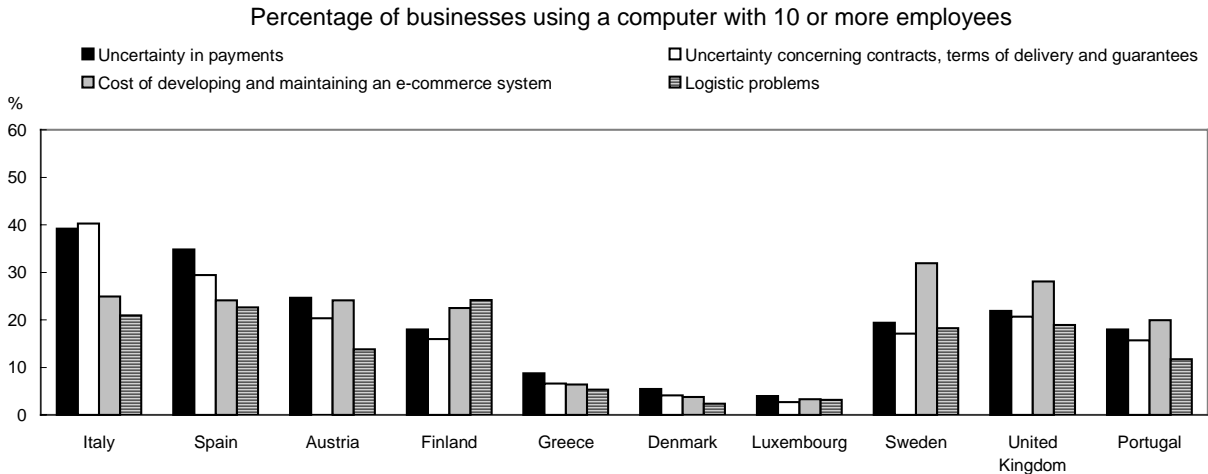
- One source of differences in countries' implementation of electronic commerce and in the impact of electronic transactions on business performance and productivity is the extent to which firms incorporate the technology strategically into their business processes. Firms carrying out transactions on line may seek greater efficiency, or speed, in their business processes or production-related efficiency, *i.e.* reduction of transaction costs or of the costs of intermediate inputs by reaching out to more efficient suppliers. Other firms may adopt e-commerce technologies to develop new business practices and change their way of interacting in the marketplace. Still others implement e-commerce technologies as a result of pressures from customers and suppliers or simply to remain competitive.
- In terms of motivation, recent data for European countries show that reaching new/more customers and geographical market expansion represent about 30% and improving efficiency about 50%. Fear of losing market share accounts for 20% at most. For all, reaching new/more customers is generally regarded as the leading motivation for engaging in e-commerce.
- Statistical surveys can also be used to measure barriers to electronic commerce transactions. The barriers and policy issues differ, depending on whether the transactions involved are business-to-business or business-to-consumer. For the former, existing transaction models or tight links with customers and suppliers along the value chain may discourage businesses from introducing new models. Questions about the security or reliability of complex systems that can link all customers and suppliers may also enter as a factor. Business-to-consumer transactions, instead, are typically hampered by concerns about security of payment, the possibility of redress in the on-line environment and privacy of personal data. Other factors with considerable impact on the development of on-line consumer transactions are ease and cost of access, convenience of shopping on line and the appeal of customisation.
- For countries for which data are available, the leading reason cited by businesses for not conducting transactions electronically was a view that electronic commerce was not suited to the nature of their business. In Canada, among businesses that did not buy or sell over the Internet, 56% believed that their goods or services did not lend themselves to Internet transactions; 36% preferred to maintain their current business model. In Sweden, Finland, Italy and Spain, 40% to 50% of businesses with computers consider their goods and services not to be well suited to e-commerce. This perceived barrier to Internet sales seems to be more relevant for real estate services and less relevant for financial services. An insufficient customer base can also be a reason for businesses not to embrace e-commerce, especially in Italy where 35% of businesses perceived this to be an important barrier.
- In Canada a small share of enterprises that did not carry out Internet commerce felt that security was a concern (14%) or that the cost of development and maintenance was too high (12%) (Statistics Canada, 2001). In Europe, instead, major perceived issues are security of payments, uncertainty in contracts and cost of development and maintenance of an e-commerce system.
- Security issues regarding handling of payments are not surprising given the very small percentage of sites that ensure secure transactions. These issues are perceived to be most critical by smaller and medium-sized enterprises in Italy, Spain, Austria, the United Kingdom, Finland and Greece. Larger businesses in Europe seem instead to be more concerned than smaller ones about logistics or cost issues related to Internet commerce.
- Many individuals in Australia, Turkey and the United States cited "lack of interest or no use for the Internet" as a reason for not having Internet access at home. Security concerns are also a significant barrier. In Australia, 29% of individuals cited security as the primary reason for not making a purchase over the Internet. Singapore users cited fear of fraud as the leading reason (Infocomm Development Authority of Singapore, 2000).

Drivers and inhibitors of Internet commerce

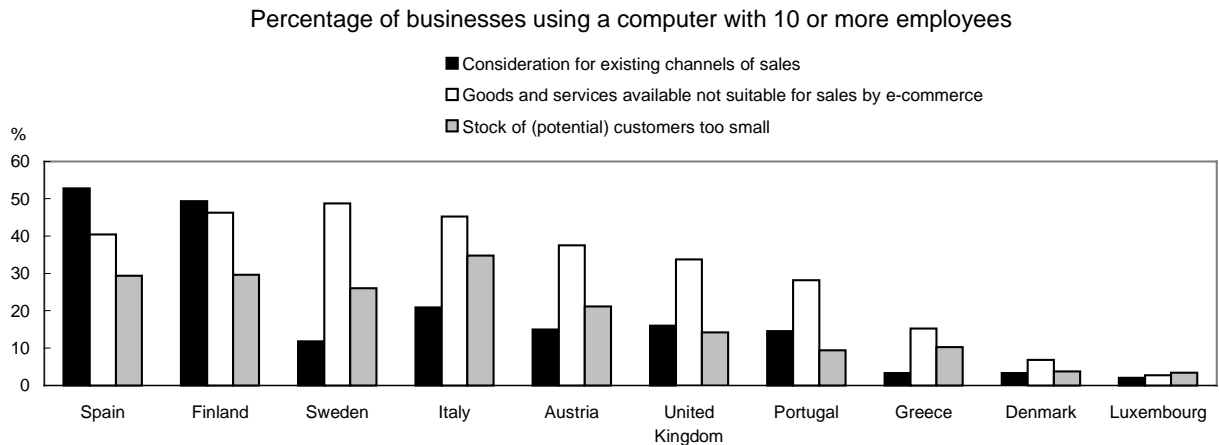
Business motivations for Internet commerce, 2000



Barriers to Internet commerce faced by businesses, 2000



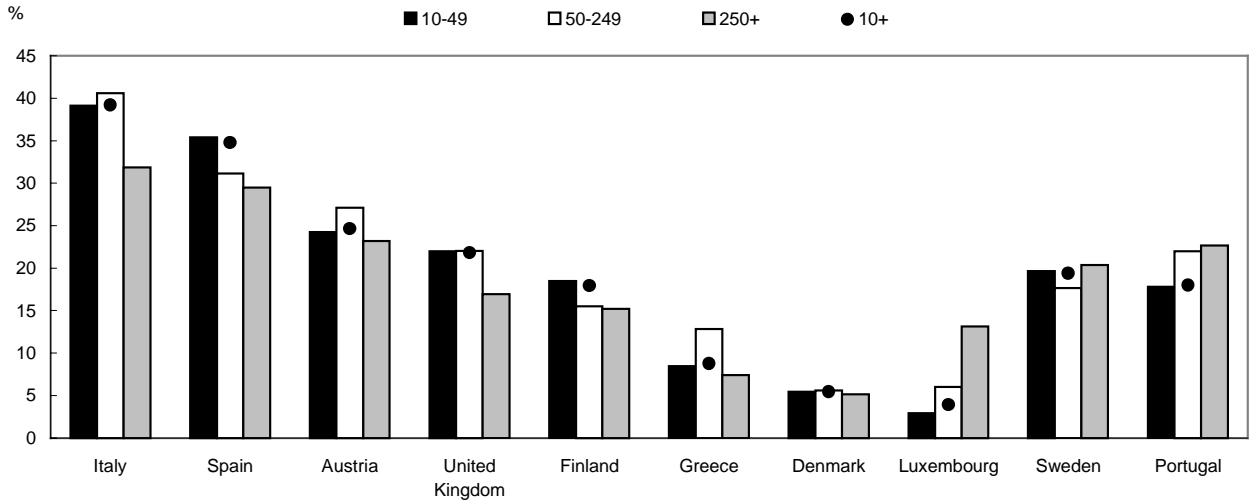
Barriers to Internet commerce faced by businesses, 2000



Barriers to Internet commerce

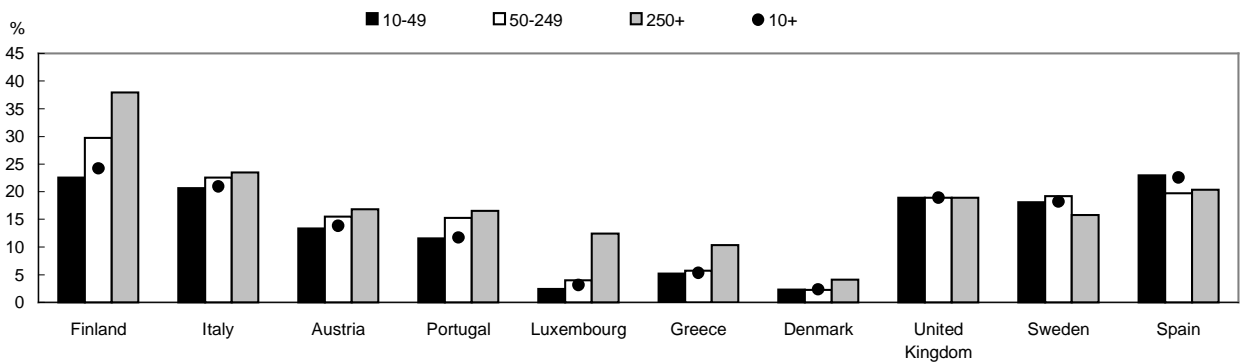
Small and large businesses facing barriers to Internet payments, 2000

Percentage of businesses using a computer with 10 or more employees



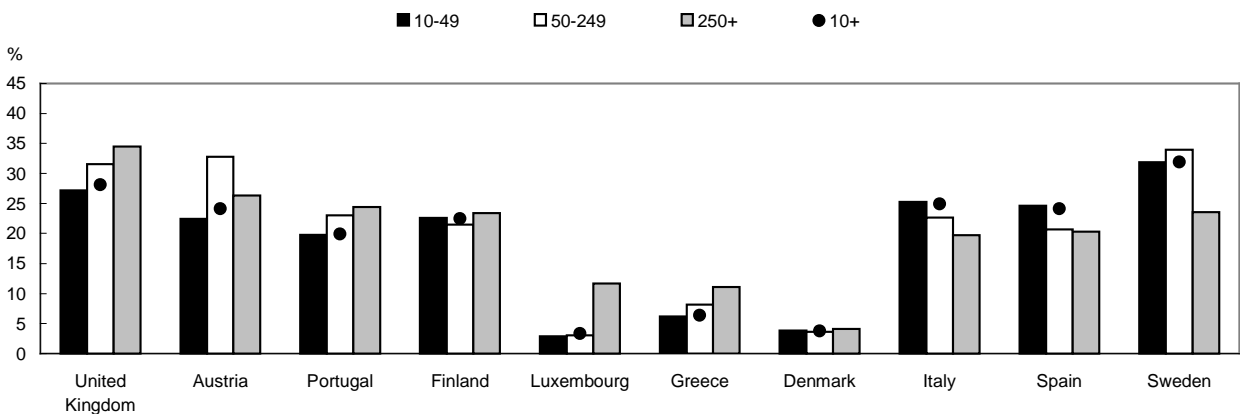
Small and large businesses facing logistics barriers, 2000

Percentage of businesses using a computer with 10 or more employees



Small and large businesses that find it too costly to develop and maintain an e-commerce system, 2000

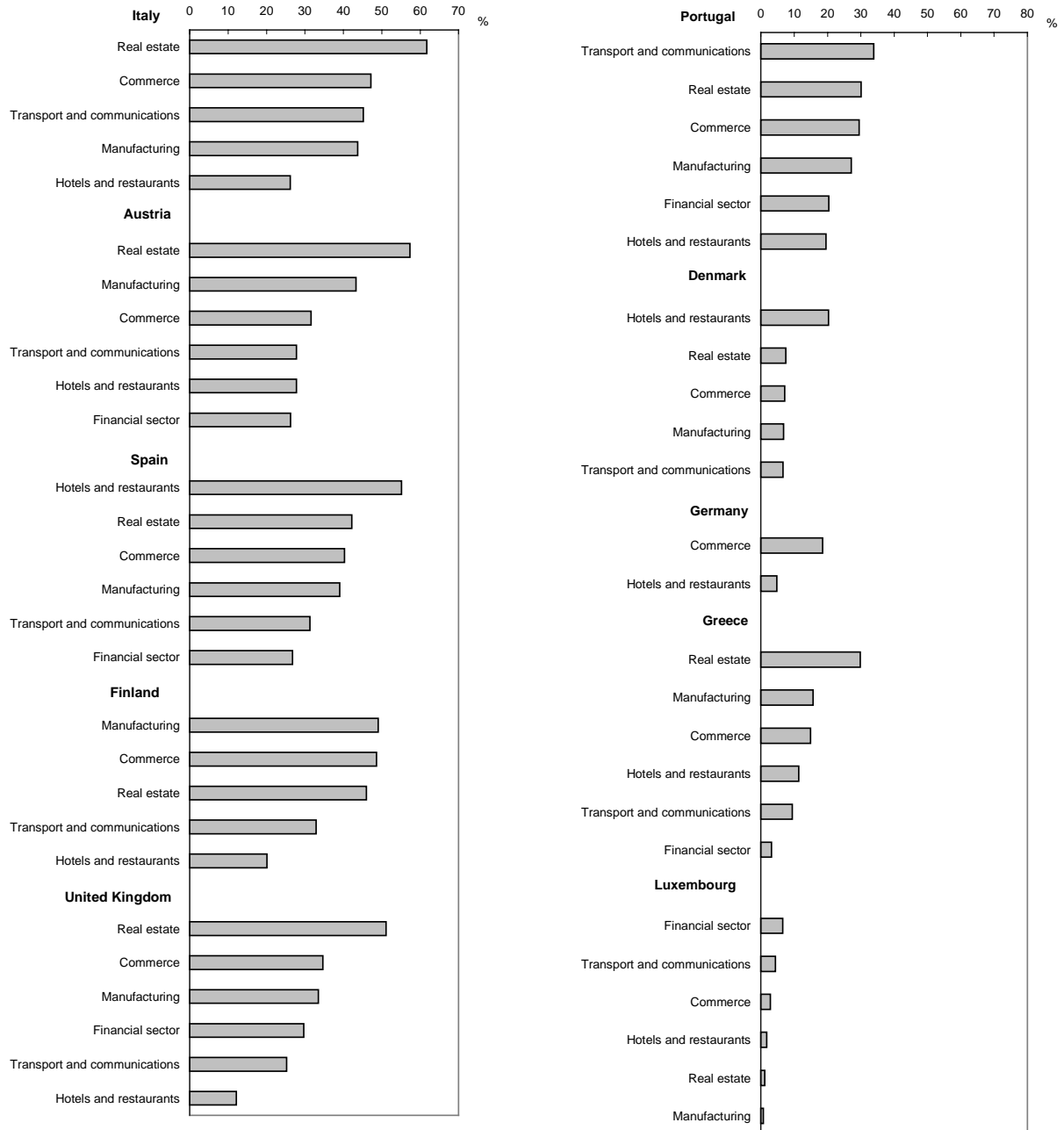
Percentage of businesses using a computer with 10 or more employees



Barriers to Internet commerce

The nature of products is not suited for Internet sales, 2000

Percentage of businesses using a computer with 10 or more employees



Source: Eurostat, E-commerce Pilot Survey 2001.