Chapter TWO
LITERATURE REVIEW

2.1 Introduction

Rapid technological progress of information and communications technologies (ICTs) have led to speculation about frictionless economies in which transfer costs are nearly zero, barriers to entry disappear and markets clear instantly. Some also think that when producer's sells directly to consumers, existing intermediaries will be eliminated (disintermediation) and thus drastically reduce transaction costs. These lower production costs will encourage entry of new businesses and thus increase competition and pressure to pass lower costs to consumer as lower prices

In general it is thought that electronic commerce can significantly improve the efficiency of economies, enhance their competitiveness, improve allocation of

resources and increase long-term growth. However since electronic commerce is at such an early stage in its development, much of this thinking is based on speculation or anecdotal evidence.

While information on the Internet interaction remains less personal than human to human interaction, it has several characteristics that make it potentially more valuable in many circumstances. First is the low cost of providing very detailed content. Secondly, the Internet allows for effective asynchronous communication, so thus information access can take place at any time. Thirdly, the Internet allows considerable flexibility in dealing with information with far greater interactivity and search capability than catalogues for instance. This reduces the cost of customizing the service, examples of which include Amazon.com, which make recommendations of likely books of interest tailored to the characteristics of the customer.

In this chapter we shall examine the impact of electronic commerce on businesses and the economy as a whole.

2.2 The impact of electronic commerce on growth

Economists are debating whether information technology can explain the acceleration in productivity growth. This debate is linked to the productivity paradox, which states that productivity statistics do not seem to provide any evidence of the impact of computer and information technology. This was coined

by Professor Robert Solow (1988) who also said that 'we see the computer age everywhere except in productivity statistics.'

There are three main positions amongst economists to explain the productivity paradox: 1) the is a mismeasurement problem 2) the is nothing paradoxical and 3) the observation of positive macroeconomic effects need decades rather than years as the economy is in the process of transition. As work on this question progresses, it is becoming clear that the paradox is unlikely to have a single solution, and the issue of whether or not computers significantly increases productivity hasn't been resolved.

A study by the Australian Government - Commonwealth of Australia, Australian Electronic Commerce Board (2000) estimated that e commerce would increase GDP by 2.7 percent (direct and indirect effects) by the year 2007. It would also increase imports and exports, improve terms of trade and increase real wages. Brooks and Wahjai (2000) estimated the macroeconomic impact of e commerce in some developed countries (US, UK, Japan Germany and France) and found that b2b e commerce will raise GDP by about 5% with half of this increase expected within the next 10 years.

The largest impact of business to business e-commerce is likely to be on small and medium sized enterprises because many large businesses already have electronic data interchange (EDI) systems in place. The accessibility of the

Internet makes electronic commerce a realistic possibility for SMEs and is likely to lead to its widespread diffusion.

APEC was one of the first regional forums to put e-commerce high on the agenda. In their blueprint for action for electronic commerce, confirmed by the APEC ministerial meeting in 1998, APEC ministers recognized: "the enormous potential of electronic commerce to expand business opportunities, reduce costs, increase efficiency, improve the quality of life and facilitate the greater participation of small business in commerce, APEC (2000).

The United States is currently the leading country in terms of e-commerce. It has shown impressive GDP and productivity growth rates during the 1990s. During 1995-2000 productivity growth has accelerated significantly, reaching an annual rate of 2.5 per cent, which is significantly higher than the rate of the past two decades. Much of this growth has been largely attributed to the use of information technology, in particular electronic commerce.

The potential size of B2B e commerce is vast. Jupiter Communications (2000) estimate that overall transactions of goods (excluding services) in the United states should amount to USD11.5 trillion in 2000, of which 336 billion are traded electronically. By 2005 Jupiter expects the online component to represent 6.3 trillion out of 15.1 trillion. Goldman and Sachs (2000) project B2B transactions to reach 4.5 trillion worldwide by 2005.

Online retail B2C e-commerce is projected to grow from 45 billion in 2000 or 1.5 percent of total retail sales to 269billion in 2005 or 7.8% or total retail sales projected for that year, Dykema (2000). In addition to this consumers are relying increasingly more on on-line to research a lot of purchases that are concluded over traditional 'brick and mortar' channels, especially for high value durable goods such as electronics and automobiles. Such purchases influenced by the Internet are expected to grow from $13 billion in 2000 to 378 billion in 2005 or 10.8% of projected retail sales, Dykema (2000). This would bring total retail sales affected by e commerce to 18.5% of total retail sales.

2.3 Value based pricing

A concept highly relevant to the analysis of electronic commerce is the function of variable costs or the law of increasing returns. US economists Shapiro and Varian (1999) noted that: Economists say that production of an information good (including an electronic transaction) involves high fixed costs but low marginal costs. The costs of producing the first copy of an information good may be substantial, but the cost of producing or reproducing additional copies is negligible. Therefore, you must price our goods according to consumer value and not according to your production costs.... Since people have widely different values for a particular piece of information (or transaction) value based pricing leads naturally to differential pricing.

According to Hagel and Amstrong (1997), The law of increasing returns in information economics involves three core features namely: high up front

expenditures and minimal incremental costs, high learning effects, progressively reducing costs and building skills and lastly network externalities or demand side economies of scale.

2.4 Network externalities

The distinctive nature of networked businesses is the operation of demand side economies of scale associated with positive feedback loops known as network externalities. The value of a network increases the more people are connected to it. The law of network externalities holds that a ten-fold increase in the size of the network leads to a hundred-fold increase in its value, Shapiro and Varian (1997).

2.5 Impact on inventory costs

In the B2B sector, e-commerce reduces costs by linking industries and suppliers electronically along the supply chain. It increases efficiency because greater competition among suppliers will reduce monopolistic profits and the number of intermediaries. Also, a better floe of information reduces inventory costs.

Directly related to savings in time associated with procurement are savings in inventory carrying costs: the faster and input can be ordered and delivered the less need for a large inventory. Each stage of the value chain holds considerable inventories. It is estimated that for retailers the cost for carrying an inventory for

a year is equivalent to at least 25% of what they receive in payment for the product, Taylor, JC (2000). Therefore a two week reduction in inventories represent a cost savings of 1% of sales. As most retailer work on margins of 3-4 % this is significant.

Dell Computers has done this very successfully through electronic commerce and claims that parts only sit in inventory for eight days before being shipped out directly to the customer, enjoying a 100% advantage in inventory turnover compared to traditional competition, resulting in 10-15% price advantage.

Another factor in reducing the costs of inventories is improving the ability to forecast demand more accurately, as the electronic commerce merchant knows exactly what the customers prefer and adjust their product line accordingly.

2.6 Impact on transaction costs

It is also widely known that electronic commerce reduces transaction costs, increases efficiency, and generates important changes in the production processes of businesses. B2C e-commerce has the potential to reduce transaction costs, increases access information to consumers thus reducing search costs, and allows consumers to find the lowest cost for a product or service. B2C e-commerce also

reduces market entry barriers due to the lower cost of setting up a website compared to setting up a brick and mortar company.

According to Garicano and Kaplan (2000) transaction costs is classified as coordination and motivation costs, and argues that B2B e commerce has the potential to effect both types of transaction costs. Coordination costs are related to the determination of prices and the details of a transaction, and the bringing together of buyers and suppliers together to conduct a transaction. Coordination costs are reduced when e commerce allows access to direct information to get lower prices at lower search costs, and improving the efficiency of the business process (through the Internet instead of conducting the business by phone or fax).

Meanwhile motivation costs are related to the costs of information incompleteness (when buyers and suppliers have incomplete information on whether the terms of agreement are fulfilled), and imperfect commitment (when buyers and sellers do not have the ability to bind themselves). E commerce contributes to reducing these costs by standardizing processes and allowing for electronic tracing of products.

The most cost reduction related to B2B E commerce will be in production costs. Goldman Sachs analysts estimated that the US's percentage saving in the costs of inputs that results from migrating from traditional procurement systems to B2B e

commerce varies from 2 per cent in for coal to 39 per cent for electronic components.

E commerce transactions aim to reduce the costs of procurement before, during and after a transaction. At every stage, e commerce automates processes that involve errors, delay and costly personnel costs through websites and electronic data interchanges.

Before the transaction, the Internet lowers the cost of searching for suppliers or buyers. Search costs may be significant relative to the value of the product. Sales representatives that have spent lots of man-hours on such a task as tracking product availability and pricing could be relived with the usage of the Internet, allowing them to concentrate on account management and marketing strategy, Slade (2000).

E commerce can reduce the costs of dealing with counterparts regarding transaction details. Transactions over the Internet avoid many costs of travel, time spent on communication, physical space for meetings and processing paper documents. After the transactions electronic commerce allows companies to lower costs of communication, monitoring contract performance or delivery confirmation.

The potential cost savings are substantial. Processing a purchase order manually can be quite expensive and online transactions might easily reduce costs by a factor of five or ten. British Telecom estimates that moving external procurement to electronic commerce has reduced its costs from $113 to $ 8 per transaction, Phillips and Meeker (2000). MasterCard estimates that the cost of processing purchase orders has fallen from $125 to $40 with the time involved cut from 4 days to 1.25 days, Alainz and Robert (1999). A financial transaction is 1.27 % for a teller, 0.27% for an ATM and 0.01% for an online transaction, Internet Economics (2000).

Despite the fact that maybe these estimated savings are greater than the average across many industries, their aggregate impact will be enormous. In the business to business domain there are also large potential cost savings from a better distribution process. When firms automate purchasing from other companies some savings to firms comes in the form of volume discounts, which represent shifting of rents rather than aggregate cost savings, Borenstein and Solaner (2001).

2.7 Disintermediation

B2B e commerce is likely to transform the traditional patterns of intermediation. Ronald H Coase's (1998) article introduced the concept of transaction costs which explains that the costs of using the market were an important determinant of whether firms should carry out an economic activity within their organizations

or rely on purchases from other firms. Companies have an incentive to vertically integrate when the cost of using the market is costly relative to management costs. Outsourcing is compelled by the buyer's need for flexibility and focus, supplier economies of scale and scope, and supplier expertise.

2.8 Improving information exchange

Since e commerce technology lowers the cost of intercompany transactions, it should tip the balance toward greater use of external markets, Lucking-Rieley andSpulber (2000). The potential effects of e commerce extend beyond saving money on transactions between firms. Costs and allocative efficiencies in e commerce suggest a more fundamental change in the way businesses are organized.

Ghosh (1998) explains the digital economy and e-commerce as the changing way in which consumers, merchants and banks interact. Retailers are able to open 24 hours a day and trade globally without the need for staff to receive order. Meanwhile, Chappel and Feindt (1999) in their analysis of E commerce practice in SME's found that in the future the B2B and B2C categories will become increasingly blurred. Longer term, the distinction may well be between consumer facing and supplier facing E Commerce where a customer may be a business customer or consumer.

Securing an Internet presence is a focal point for SMEs as large companies are moving towards transforming themselves into Internet enabled companies no longer tied into proprietary networks will choose similarly enabled partners to trade and for a business relationship with. Where large economies of scale were once used as barriers to competition these barriers are being eroded by e-commerce.

Management constancy firm AT Kearney (1999) suggests that small suppliers that fail to get online to meet large corporations implementing business to business communities could have a bleak future. Their study of 162 corporations throughout 28 countries shows that these corporations are expected to increase B2B transactions over the Internet by a massive 1,175%. AT Kearney suggests that we are currently experiencing a 'rush for the web' with large companies aiming to place orders of 20% online compared to just 2% at the moment.

2.9 Conclusion

In terms of social welfare, there are a number of reasons to believe that e-commerce will increase social welfare. It will benefit consumers by helping them enjoy lower prices and giving them more choices. The savings on search costs for both buyers and seller are likely to be substantial. Increasing the number of product offerings can also result in a first order increase of welfare, Hotelling (1929); Salop (1979).

The key impediments in capturing the cost savings of e commerce and the Internet will not involve technical issues but rather inertial forces that relate to organizational issues, the importance of compatibility with legacy systems and non technological transaction costs. In addition if communications across firms is to work well, each industry must undertake a great deal of work to agree on specific information templates suited to that industry, and as with most consensus standards processes, these are often lengthy and political.