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COMPETITION AND INNOVATION:
SMALL AND MEDIUM ENTERPRISES IN THE NEW ECONOMY

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ABSTRACT

The advent of the “New Economy” has important implications for how small and medium-sized enterprises will compete. This paper proceeds by examining the key characteristics of the industries of the New Economy, and what they mean from the perspective of innovation and competition for SMEs.

1. INTRODUCTION

The advent of the “New Economy” which has emerged in the last two decades or more has, like the Industrial Revolution more than a century ago, wrought “fundamental economic transformations” (Stiglitz, 1999). This poses great challenges as well as great opportunities for business. The industries of the New Economy are characterised by a number of prominent features that have both contributed to and resulted from its emergence. These features have important implications for business in general, but in this paper we shall focus on the implications for small and medium-sized businesses.

The paper is structured as follows. In the following section we identify some of the key characteristics of the New Economy and assess what they imply for the nature of competition. Specifically, we shall look at the implications for small and medium enterprises.

2. CHARACTERISTICS OF THE NEW ECONOMY

The New Economy is also variously referred to as the “Knowledge Economy”, the “Digital Economy” and the “Cyber Economy”, among other terms. Despite the widespread use of these terms, there is no generally agreed definition of what they mean. However, because the terms are frequently used to characterise the technological and economic transformations which economies around the world are undergoing (European Commission, 2000), it makes sense to focus on the key features or characteristics of the New Economy. These characteristics may be said to define the New Economy, just as the “Old” (Industrial) Economy may be said to be defined and characterised by factories, assembly-line mass production techniques, and a focus on manufacturing. There are four interrelated characteristics or features of the New Economy which may be identified. These are now discussed in turn.
The Role of Information

The primary feature of the New Economy is the dominant role played by information or knowledge. Information features importantly as both an input and the output of many products and services. According to the Canadian Information Highway Advisory Council (1997, p. v):

"[In a knowledge-based economy, ideas and information effectively overshadow physical goods and services as the primary units of production, distribution and consumption."

Reliance on Information and Communications Technology

The key role of information in the New Economy is closely related to the second feature, a heavy reliance on information and communications technology (ICT), which in turn is a direct result of rapid advances in that technology. The extraordinary rate of innovation and progress that has occurred in ICT in recent decades have led to equally dramatic declines in the cost of information processing and communication. Computer programs today are an order of magnitude more sophisticated and powerful than those of just a decade ago, and businesses and households increasingly rely on them to carry out routine functions. In communications, the Internet and mobile and other forms of communications technology have spread to every corner of the globe. Indeed, the use of ICT now permeates almost every aspect of developed economies around the world.

The very nature of ICT, its widespread use, and the sheer economic logic to develop common standards and interoperability among different systems to enable "interconnectivity" between them means that network effects, sometimes referred to as economies of scale in consumption (Hahn, 2001), are pervasive.

Network effects refer to the benefit or value derived by a consumer over and above the value received in the absence of other users of the good. The latter, the standalone value of the good to the consumer in the absence of other users, has been termed the "autarky" component. The former, the value derived by the consumer from being part of the network of users, is the "synchronisation" component (Liebowitz and Margolis, 1998). Metcalfe's "law", which states that the utility or value of a network is in direct proportion to the square of the number of participants in the network, nicely conveys something of the power of network effects: the value of the network to users grows at a rate far in excess of the number of users.

1 Information and knowledge are obviously not the same thing. In particular, information needs to be internalised before it becomes knowledge — recognised in the conceptual distinction often made between explicit knowledge and tacit knowledge (see, e.g., Nonaka, 1994). In the context of the New Economy, however, the transmission of information is the crucial process that enables many of its markets to function and thrive. For this reason, authors in this area often use the terms information and knowledge interchangeably, or they qualify it. Quah (2001), for example, refers to "codifiable knowledge".

2 Strictly speaking, Hahn is referring to direct network effects (discussed below).
When network effects are large, the synchronisation component is a large proportion of the value derived by a consumer from a product. Two types of network effects may be distinguished (Liebowitz and Margolis, 1998). Direct network effects are generated directly through the number of users of a particular product on its value to an individual user. Telephones and fax machines are typical examples of goods exhibiting direct network effects. With a small number of users, the value of a fax machine to an individual is limited; as the number of users increases, so does the value to the user because the potential use of the machine goes up. While network effects are observed in goods that do not necessarily have a direct connection with ICT – the QWERTY keyboard (at least in its early manifestations) being an oft-cited example – it is in ICT-related applications that they are arguably most marked.

Indirect network effects, which may be termed economies of scope in consumption, occur when the value of a product increases as other products related to its use are developed. In other words, as the network size increases, so does the number of complementary products available to members of the network. One reason for the popularity of the Windows-based personal computer over the Mac is the fact that Microsoft worked harder to make it easy for developers to write software applications for Windows (Hahn, 2001).

The existence (some would say prevalence) of network effects in the New Economy has important implications for the nature of competition. Because networks take time to build up to "critical mass" (i.e., become widespread enough to be economically viable), producers that are sufficiently ahead (in both time and appeal to the market) of the competition with a new product or application will be able to acquire the necessary critical mass to exploit economies of scale. Economies of scale are common among information goods. Once network effects kick in, new entrants to that segment of the market will be confronted with a daunting barrier to entry as consumers are presented with plenty of incentives to remain part of the dominant network, and very few to be part of the "new boy's club".

The widespread use of ICT also means that the fact that information or knowledge is not easily constrained by the boundaries imposed by geography and politics is even truer today than it has ever been at any time in the past. An important aspect of the revolution in ICT is the codification of information or data that can be transmitted almost costlessly around the world and interpreted and manipulated by computers. This has led Stiglitz (1999a,b) and others (see Kaul et al. 1999) to argue that, unlike most public goods whose benefits are limited geographically, knowledge is a global public good. The application and production of information or knowledge generates processes and/or goods that are highly innovative. This is aided by the codification process – the conversion of text, images and sounds into a sequence of zeros and ones – which has meant that information expressed in different media can be just as easily manipulated, customised and repackaged by computers at low cost.

Stiglitz (1999a) identifies four others: international economic stability, international security (political stability), the international environment, and international humanitarian assistance. Some authors (Kaul et al. 1999, Sandler 1999) suggest that the concept of a global public good should be extended beyond purely geographical notions to encompass inter-generational aspects.
Cost Structure of Information Goods

The third feature of the New Economy is the cost structure that information goods tend to exhibit. Although the development costs of information goods are often very high, the marginal cost of producing an additional unit tends to be very low: making a digital copy of an information good is very inexpensive. Many goods (films, software) require large fixed costs of development, although subsequent copies can be turned out at negligible marginal cost. This means that there are economies of scale in industries exhibiting this kind of cost structure, which in turn translates to a form of first-mover advantage for the firms that are able to build up sufficient market mass to take advantage of the scale economies. This is bad news for the more sluggish firms. On the other hand, entry costs in some sectors of the New Economy are dramatically lower than the corresponding costs for their physical-world counterparts: for example, the operating costs of web-based businesses can be much lower because of savings on fixed costs. Firms that only operate online bear lower costs because of savings in terms of the rental of office space, administration and other operating costs. This suggests opportunities for SMEs.

Competition will therefore tend to increase and firm size to decrease because entry costs and fixed costs of operation are lower. Other kinds of fixed or entry costs, however, may increase. For example, new online firms may find it necessary to invest heavily in building a reputation or brand – but this has always been the case for most SMEs even in the physical world.

In addition, there are widespread economies of scope arising from the digitisation of information. Products created for a particular market can be packaged with other material, or modified and customised for other markets and uses at low cost, allowing the fixed costs of development of the initial products to be spread more widely. The presence of economies of scope would tend to reinforce the tendency towards greater concentration and less competition.

Global dimensions

The fourth feature of the New Economy is its global dimensions and reach. As we note below, this has the potential to create huge opportunities but also risks for SMEs. One of the traditional disadvantages faced by SMEs has been lack of access to markets. The use of the Internet and generally the ability to tap into the power of ICT has dramatically altered this dimension for SMEs. Distant markets and customers can potentially be reached relatively inexpensively, and even firms catering to niche markets may find themselves more economically viable because of global access. The size of the pie has increased proportionally. The downside, of course, is that whereas previously competition had been limited to geographically proximate rivals, it is now global.

3. WHAT DOES ALL THIS MEAN FOR SMEs?

In general, it is fair to say that the New Economy has brought with it vast opportunities for those SMEs able to take advantage of them. If the twentieth century was the century of big business and conglomerates, the twenty-first may well turn out
to be the century of the entrepreneur. Never before in history has the small entrepreneur had so many resources at his or her disposal. Many commentators have noted the potential of the technologies of the New Economy to dramatically change “the way businesses work, thereby yielding a quantum shift in productivity” (European Commission, 2000). This has two important dimensions. First, small and medium sized enterprises are able to accomplish far more than was possible before, because of the ability of businesses generally to access the capabilities of ICT. This encompasses the whole range of the operations of a business, from production to marketing to the general organisation of the business. Second, both product and process innovations are spurred by the combination of ICT and highly-skilled labour driven by profits to maintain competitiveness.

As DTI (1999) has noted:

Newer firms (mainly SMEs) can have a tremendous advantage in comparison to larger organisations. Not only do they have the speed of communication and learning but also they do not bear the heavy cost of maintaining physical assets. They can exploit the latest technology and build their systems around that technology. And often the traditional barriers to small firms competing with larger ones are being removed. For instance, ICT allows small firms to access international markets without the need for a global marketing network.

The advent of the New Economy has important implications for SMEs in several ways. First, transaction costs and a wide array of fixed costs are dramatically lowered, which tends to level the playing field, which had been tilted against SMEs by virtue of their lack of size. Second, the nature of competition has altered. In an environment of relentless innovation, competition in the New Economy resembles not so much the conventional static competition of neoclassical economics as the Schumpeterian one driven by the process of “creative destruction”.

As Graham (2001, p.157) has observed, regarding Internet commerce, an important and growing part of the New Economy, although his comments are applicable to the New Economy generally:

[T]he Internet appears to be moving through phases that bear a resemblance to those of earlier technological revolutions (such as the discovery of electricity). In broad terms, the first phase is dominated by pure research (often taking place in universities or in research institutes with public funding). In the second phase, when the original discovery has been made, but no one knows exactly how to use it, all kinds of experiments are made. This second phase is particularly suited to small firms and venture capital. Many new firms are born but a great many fall by the wayside. In the third phase the market consolidates and large firms with their superior marketing facilities and worldwide reach take the lion’s share.

As he goes on to note, the process is one of Schumpeterian competition. In this process, market leaders attain their dominance by virtue of innovations that allow them to leap-frog over the previous leaders, and the fear of being overtaken in this way by new upstarts is what keeps the incumbents relentlessly innovating. Schumpeterian competition, the ascendancy of the most innovative, dramatically levels the playing field for smaller entrepreneurial firms that are able to innovate.
Another aspect of competition and innovation relates to the nature of information goods. As Stiglitz (1999b) notes, each piece of information, almost by definition, is different from every other piece of information. This, in combination with the possibilities offered by ICT, implies vastly expanded opportunities for customisation and catering to niche markets, which often tends to favour SMEs that are otherwise disadvantaged because they do not have the economies of scale possessed by larger firms in the same industries.

The industries of the New Economy are characterised by high levels of workforce skill that are well placed to take advantage of the opportunities offered by the new environment. Innovations may be divided into two broad types: process innovations and product innovations. Process innovations may involve firms in more traditional industries automating processes that had previously been performed laboriously. Typically these include back-room operations (processing orders, etc) that involve information flows both within the business and between the business and its customers, functions that are well performed by ICT. Process innovations may also result in the emergence of new types of intermediaries that are able to capitalise on the information-processing and communication power of the technology. Thus, while the New Economy, by significantly lowering transaction costs, may result in a process of disintermediation in many traditional functions performed by middlemen, opportunities exist for the creation of new roles and functions for quite different classes of intermediaries that could not exist before.

The transformation of the intermediary function typically performed by SMEs will be affected by several factors, including the following:

- To the extent that transaction costs permit, some producers may find it more economical to sell directly to their end-consumers rather than utilising intermediaries (changes driven by transaction cost advantages)

- In other cases, new forms of intermediaries may emerge which are able to capitalise on the features and strengths of ICT – e.g., web portals featuring firm clusters organised either geographically or by industry, auction sites like eBay and Yahoo (changes resulting in previously non-existent types of intermediaries)

- Intermediaries that essentially perform the same functions as their physical-world counterparts but with quite different cost profiles that reflect the cost advantages of ICT in the provision and transmission of information – e.g., Amazon and CDNow, which are popular examples of process innovations, although there are numerous examples in more traditional industrial contexts

- Intermediaries that are driven by both product and process innovations

Two kinds of businesses are typically distinguished in e-commerce: business-to-business (B2B) and business-to-consumer (B2C). The former is the kind of business that most SMEs find themselves in, as suppliers to larger businesses. In the new environment of electronic commerce, SMEs that are part of B2B value chains will be forced to consider whether they are in danger of being squeezed out of the value
chain, and if so, how they can stay relevant by creating new forms of value that allow them to retain their positions in the chain.

A different set of issues confronts firms that are considering getting into B2C businesses – that is, selling directly to consumers. While fixed costs are often much lower than in the physical world, other kinds of fixed costs can represent barriers to entry. In particular, they may have to incur large costs in building a credible online presence through advertising and other means. Asymmetric information is particularly serious in B2C businesses, raising problems associated with credibility, reputation and lack of trust on the part of consumers.

4. SUMMARY AND CONCLUSIONS

A number of broad issues have been discussed in this paper. First, dramatically reduced entry costs and transaction costs will tend to produce enterprises of smaller size in the New Economy. Second, there are clear advantages to being the first mover in the New Economy. There are several sources of first-mover advantage. These include the existence of economies of scale, network effects and lock-in (by which customers are “locked in” to the products of the dominant firms because of the high cost of switching over to the products of rival firms).

Third, as these effects tend to translate into high entry barriers to aspiring firms, they will tend to produce dominant firms in each industry. Economies of scope will also tend to produce firm concentrations.

Fourth, the first and third points do not necessarily contradict each other. What they suggest in combination is that industries will tend to be dominated by a small number of powerful firms, but also will be inhabited by a large number of small firms that will operate either in the mainstream or in small niches. These firms pose a continual threat to the dominant firms as they constantly strive to innovate. While many commentators argue that the process of Schumpeterian competition will operate in general to maintain the flow of innovation, this view is by no means universally held. For example, Stiglitz (1999b) has argued that

... Schumpeter's conjecture, that a succession of entrants would provide competitive discipline, [is] not in general true. Even small entry costs could result in large monopoly power, with not only prices being maintained high, but with the pace of innovation far slower than under competition.

He goes on to sound a note of warning for policymakers:

As we move into the “knowledge economy” just as the new technologies provide greater scope for the suppression of competition, the consequences may be more adverse... [T]he kind of creativity that is essential for the knowledge economy requires the engagement of the mind. Organizational, small new enterprises often have provided more fertile ground for this kind of creative engagement than do large established bureaucracies. Many of the most important innovations
have originated in these small enterprises. These firms typically begin with a number of disadvantages, such as lack of access to inexpensive capital. If, in addition, there are artificially created market (anti-competitive) barriers then the pace of innovation may well be slowed.

Finally, it is clear that information and knowledge will determine the economic destinies of countries. As the OECD commented in a 1995 report:

Knowledge in all its forms plays today a crucial role in economic processes. Intangible investment is growing much more rapidly than physical investment. Firms with more knowledge are winners on markets. Nations endowed with more knowledge are more competitive. Individuals with more knowledge get better paid jobs. This strategic role is at the root of increasing investments by individuals, firms and nations in all forms of knowledge. (OECD, 1995, quoted in Soete and Weel 1999).

In other words, policies that encourage investments in knowledge and the acquisition of skills, and that encourage SMEs with those skills to capitalise on them, will win the day.

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