

Postal Services in the New Economy

Cassey Lee

Faculty of Economics & Administration

University of Malaya

E-mail: g2cassey@umcsd.um.edu.my

Abstract

The emergence of a “new economy” driven by advances in and diffusion of information and communications technology changes the way we communicate, transport products and carry out financial transactions. Increasing use of the internet for communications purposes will reduce the postal services’s role in this area. Since the bulk of e-commerce are B2B transactions involving non-information goods, postal services will continue to be important for goods delivery. Vertical integration and investments in delivery networks amongst parcel and express delivery firms will bring about intense competition in postal services. Traditional regulatory concerns such as natural monopoly and universal services will remain valid in the new economy. However, the new economy will bring about a subtle shift change in regulatory focus. Network effects, which are amplified in the new economy, will invite regulatory scrutiny on issues such as market power.

The Issues and Challenges Facing the Postal Industry in Malaysia
Postal Industry Workshop

Organized by:

Malaysian Communications & Multimedia Commission

Kuala Lumpur, 4 October 2001

Postal Services in the New Economy

Cassey Lee

Faculty of Economics and Administration
University of Malaya

1 Introduction

For a long time postal services met three types of distinct but interrelated needs of consumers - communications, transportation and financial services. Over the years, as economies develop and new technologies emerge, postal services have undergone gradual changes. Postal operators have taken up new services while divesting others. One recent change is the emergence of a “new economy” that is characterised by significant improvements in and diffusion of information and communications technology (ICT).

In the past, postal services remained in use extensively despite technological changes. In fact, these changes often enhanced the role of postal services in the economy. With the emergence of the new economy, the resilience of postal services is being called into question. For example, will electronic mail make physical mail delivery obsolete one day?

This paper examines the future prospects of postal services in the context of the new economy. In particular, we seek to understand the various functions of postal services in our economy and draw a few conclusions about how these functions will continue to change under the new economy.

Section 2 briefly surveys the main economic characteristics of postal services. The nature of the new economy and its impact on postal services are examined in Section 3. Section 4 examines some of the regulatory issues that arise for postal services in the new economy. Section 5 concludes.

2 The Economics of Postal Services

An understanding of the future of postal services requires an appreciation of what postal service is. This section briefly reviews the economic characteristics of postal services in order to better understand the present state of the industry as well as conjecture its future trajectory in the new economy.

2.1 The Postal Services Market

Postal services can be defined in the following manner:

“From a technological perspective, postal services are a form of delivery or transportation service, for carrying goods from one point to another.” (OECD (1999b), p.23)

The above definition implies a certain degree of functional overlap between postal services and other types of delivery or transportation services such as commercial shipping and freight forwarding services. But what sets postal services apart from these services is the regular, scheduled and dense delivery rounds that postal services undertake:

The “core business” of postal services is the delivery of addressed goods for which the nature and volume of the goods is such as to support regular, scheduled, dense deliveries in a region (where “dense” means a delivery network which deliver to or passes close by every delivery point in a region). (OECD (1999b), p.24)

Still, there are other types of services that can justifiably included when we use the above definition of postal services. They include:

- express mail services;
- parcel services; and
- unaddressed mail services (newspaper delivery and direct advertising/marketing mail).

From our earlier discussions it is clear that one of the key function of postal services is the **transportation** of goods. Postal services also serve another

function, namely, that of **communications**. Hence, the competitors of postal services can include telecommunications services such as fax, e-mail, and electronic bill-payment services.

Because of the vast network of post offices in most countries, postal services have often subsumed a third role, namely, the provision of **financial services**. This activity would include financial transfer and payment services as well as the mobilization of surplus financial resources from households via deposit taking especially in the rural areas where private financial services may not be available at a convenient location. However, as a country’s financial infrastructure develops, the incumbent postal operator tends to divest its deposit taking activity. When this occurs, the incumbent postal operator is left with payment services (e.g. postal order, bills settlements etc.)

2.2 Demand and Supply

Who are the “consumers” of postal services? To a large extent, organizations are more important individuals in the business of letter and parcel mail delivery. From Table 1 we can see that 80 per cent of letter mails and 85 per cent of parcels in the US are sent by organizations.

Table 1: Composition of Postal Service Demand

Type	Letter Mail	Parcel Mail
Individuals to Individuals	10%	10%
Individuals to Organizations	10%	5 %
Organizations to Individuals	45%	60%
Organizations to Organizations	35%	25%

Source: OECD (1999b)

The delivery of postal services involves various activities:

1. Collection - picking up mail (letter and parcel) at collection points
2. Outward Sorting - sorting of inbound mail by geographic destination
3. Transportation - moving mail between sorting centers
4. Inward Sorting - sorting of outbound mail by geographic destination

5. Final delivery - moving mail from final sorting centers to customers

How important are these activities? Table 2 summarizes the relative importance of each of these activity in terms of their contribution to total production cost. The most important cost component in postal services is that associated with the final delivery activity. This activity takes up close to 65 percent of the total cost of postal services.

Table 2: Supply Characteristics of Postal Services

Activity	Composition of Cost	Scale Economies?
Collection	10 %	No
Outward Sorting	18 %	No
Transportation	2 %	No
Inward Sorting	5 %	No
Final Delivery	65 %	Yes

Source: OECD (1999b)

The question of market structure is very much tied to the issue of scale economies and entry barriers. Of all the activities involved in postal mail services, economies of scale is said to exist in the final delivery activity. The high cost of investment in the final delivery activity also act as an entry barrier. Both the existence of scale economies and entry barrier in final delivery suggests that this segmet is a natural monopoly i.e. average industry cost is lowest when there is a single operator in the market.¹

¹OECD (1999b)

3 The New Economy & Its Impact on Postal Services

This section explores the characteristics of the new economy and its impact on postal services. We begin by defining what the new economy is and proceed to explore its implications for postal services.

3.1 What is the New Economy?

The term “New Economy” is primarily used in the context of the productivity resurgence in the US that coincides with high investment in, and diffusion of information and communications technology (ICT) and its applications.² Even though the US economy is presently on the verge of experiencing a recession, these developments are sufficiently important to warrant continual use of the term.

The significant advances in information processing (computing) and communications capabilities in the new economy have several dimensions:

- **Enormous increases in computer processing capacity.**

Moore’s Law predicts that computing power doubles every 18-24 months due to advances in microprocessor technology.

Today, a car like Ford Taurus contains more computing power than the mainframe computers used in the Apollo space programs used in the 1960s and 1970s.³

The microchip in a musical greeting card contains more computer power than we had on the entire planet in 1945.⁴

- **Rapid decline in the cost of computing power.**

In 1970, one megabit of DRAM cost US\$5,257. In 1999, this would cost only 17 cents! (see Table 3). Similarly, computer processing power has also declined rapidly.

²OECD (2001)

³Economist (2000)

⁴Coyle (1997)

Table 3: Cost of Computing & Communications Power

Computing / Communications Power	Cost in	Cost in
	1970 (US\$)	1999 (US\$)
1 Megabit Storage	5,257	0.17
1 MHz Processing Power	7,601	0.17
Sending 1 Trillion Bits	150,000	0.12

Source: Economist (2000)

- **Massive increases in the capacity and speed communications networks.**

Gilder's Law predicts that communications power doubles every six months.

Today, more information can be sent over a single cable in a second than in 1997 was sent over the entire internet in a month!⁵

- **Large reduction in the cost of transmitting information**

In 1970 the cost of transmitting an electronic file containing the *Encyclopaedia of Britannica* from Los Angeles to New York is US\$187. Today, it would cost just US\$40 to do the same thing.⁶

The cost of transmitting a trillion (1,000,000,000,000 or 1 million MB) bits of information from Boston to Los Angeles has declined from US\$150,000 in 1970 to US\$0.12 in 2001!⁷

The consequences of this on the demand for ICT-based technologies, applications and services are two-fold:

- An increase in the usage of computers by firms and households

The number of internet users have increased exponentially from 16 million users in 1995 to more than 400 million in the year 2000. ⁸

- An increasing usage of internet-based technologies for personal and business purposes.

⁵See UNDP (2001)

⁶Economist (2000)

⁷See UNDP (2001)

⁸See UNDP (2001)

For example, in the area of e-commerce, business-to-consumer (B2C) transaction volume has risen from US\$27 billion in 1998 to US\$200 billion in 2000. Meanwhile, during the same period, business-to-business (B2B) has grown from US\$92 billion to US\$2,940 billion.⁹

An important driving force in the rapid increase in the usage of ICT-based technologies for communications is emergence of new ways of transmitting data, voice, audio, and video. In addition, the ability to digitize these information leads to convergence in multimedia and communications.

Finally, network effects are becoming more important. Robert Metcalfe, a pioneer of computer networking, argues that the value of a network grows roughly in line with the square of the number of users.¹⁰ This extends not only to households but more importantly, to firms as well. In the latter case, new ways of organizing production and distribution is now possible.

3.2 Impact on Postal Services

What are the consequences of developments in the new economy for postal services? To answer this question, it is useful to look at whether the new economic activities generated in the new economy are substitutes for or complements to postal services.

(a) Communications

Of the three functions that postal services serve (transportation, communications and financial intermediation), the greatest direct impact will be on communications. This is because any good that is sent via postal services for the purpose of communications is in fact a type of information good that can be digitized and sent over the internet. As a result, communications via the internet (e-mail) is a substitute for communications via postal services (snail mail).

Communicating via snail mail has several disadvantages compared to e-mail. Not only does snail mail take a longer time for delivery, their cost is relatively high compared to e-mail (Table 4). In addition, e-mail has the advantage of mobility - recipients can check their mail from pretty much anywhere around the world as long as these places provide access to the internet.

⁹Fraumeni (2001)

¹⁰Economist (2000)

If e-mail has so many advantages over snail mail will it mean that the latter will eventually become obsolete? This is a real concern for postal services. An example is the following quote from the US Postmaster:

“In the last five years the postal service has lost about 35 per cent of its business-to-business first class mail, or US\$6 billion in revenues, to E-mail, teleconferencing, and faxing. These electronic services, especially e-mail and faxes, are cutting into the service’s first-class mail business, which generates 57 per cent of its revenue.”¹¹

Table 4: Comparison Between Snail Mail and E-Mail

Aspect	Snail Mail	E-Mail
Speed of Delivery	Slow	Fast
Cost of Delivery	High	Low
Access Cost	Low	High
Security	High	Low
Location of Receptient	Fixed	Mobile

Source: Adapted from OECD (1999b)

For all the advantages that e-mail has over snail mail, the latter will continue to be used particularly in developing countries. Not only do people in developing countries have little access to computing facilities, access to the internet are also likely to be high (compared to developed economies). For example, US’s per capita income is about four times that of Malaysia but the number of internet host (per 1,000 people) in the US is about 75 times that of Malaysia (Table 3). Communications cost tend to be also lower in developed economies. A significant gap in ICT knowledge also exists between populations in the developed and developing nations.

Still, as developing countries such as Malaysia develops, customers of postal services in these countries will increasingly turn to the internet to meet their communications needs. This implies that services that offered by the post office for the purpose of communications will continue decline in the new economy. This applies to letter delivery services which account for the bulk of postal services revenues of incumbent postal service operators (around 45.7

¹¹Business Week (1998)

Table 5: Diffusion of ICT-Technologies in Selected Countries, 1999

Country	GDP Per Capita (PPP US\$)	Population Size (millions)	Internet Hosts (per 1,000 people)	Cost of a 3-min local call (PPP US\$)
USA	31,872	280.4	179.1	na
Japan	24,898	126.8	49.0	0.06
UK	22,093	59.3	57.4	0.17
Korea, Rep.	15,712	46.4	4.8	0.06
Malaysia	8,209	21.8	2.4	0.06
Thailand	6,132	62.0	1.6	0.23

Source:
UNDP (2001)

per cent.¹² Private postal operators will be less affected by this change as letter delivery services account for a small proportion of their total revenues.

(b) Transportation

The impact of the new economy on the transportation / delivery services offered by postal services depends on the type of goods that are being transported. A useful classification involves categorizing goods as either information goods or non-information goods. Information goods can be defined as those goods that can be digitized:

“I take this to be anything that can be digitalized - a book, a movie, a record, a telephone conversation. Note carefully that the definition states anything that can be digitalized; I don't require that the information actually be digitalized.”¹³

The distinction between information goods and non-information goods is important because there is an alternative way to deliver information goods in the new economy.

Information Goods

In the case information goods, the transportation of information goods goes through two stages of development in the new economy:

¹²OECD (1999b)

¹³Varian (1998)

(a) In the **first stage**, consumers change their purchasing pattern by buying information goods from online stores instead of retail stores (brick and mortar). This will occur when online stores are able to improve upon the availability (wider selection) and pricing (lower prices even after shipping cost is included). As these goods need to be delivered, this change in purchasing pattern will boost demand for transportation / delivery services. Hence, this development will have a positive impact on postal services.

One constraint to the development of Stage I is security. Consumers are still wary of purchasing online due the perceived risk of fraud in online purchasing (which typically involves credit cards).

(b) In the **second stage**, the method of product delivery for information goods purchased online changes from physical delivery (of CDs, Books, Videos) to internet delivery (download from sellers' sites). Hence, when the goods that are being transported are information goods (e.g. software, books, magazines, audio and video CDs), internet delivery can substitute for postal service's physical delivery. At present, many of these products are already available for purchase and download directly at the internet. In fact, due to the cost savings (e.g. production, handling and transportation costs) derived in such online transactions, the prices quoted for this mode of delivery are usually cheaper (see Table 6).

Table 6: Product Prices: Physical Delivery vs. Internet Delivery

Product	Internet Deliver US\$	Physical Delivery US\$
Stephen King's <i>Black House</i> at Amazon.com	11.97	22.8 (Domestic US, 3-7 Days)
Enya's <i>Only Time</i> at CDNow.com	1.49	11.99 (singles)
<i>Salon Premium</i> at Salon.com, NewYorker.com	30 (Annual)	46 (New Yorker, Annual)
<i>Norton AntiVirus 2002</i> at Symantec.com	49.95	49.95

Internet delivery of information goods is only constrained by limitations in internet infrastructure such as bandwidth. Delivery of a 10MB information

good via a 56Kb per second delivery channel will take 2 hours 50 minutes to download. A typical MP3 music file with playtime of about 3-4 minutes (and memory space about 4-5 MB) will take one to one and a half hours to download! Hence, until the population of consumers have access to high internet bandwidth, e-commerce involving information products will be severely constrained.

Another important constraint is piracy. The public good nature of information goods (i.e. nonexcludable and nonrival) and their low cost of reproduction makes them susceptible to illegal reproduction and sale (piracy). However, these problems will eventually be resolved in the future.¹⁴

Non-Information Goods

The impact of the new economy on the transportation of non-information goods is more straightforward. All the positive spillovers from the development of e-commerce will accrue to postal delivery services. This has been discussed above in the case of information goods (Stage I). In this area, an important aspect would be the competition between the incumbent postal operator and private postal operators (such as parcel and express delivery services). In addition, firms in the business of delivery services may further vertically integrate with transportation firms (e.g. trucking companies) to gain operational advantages over their rivals. For example, in the US, Federal Express acquired a large trucking company American Freightways for US\$1.2 billion in 2000. Its rival, UPS acquired another trucking company for US\$450 million. Such developments will no doubt intensify competition in the postal services sector.

(c) Financial Services

Over the years, the range of financial services offered by post offices have declined in tandem with the development of financial infrastructure. As banking facilities multiply, post offices have divested their banking activities (deposit taking and loan granting). What remain today with the incumbent

¹⁴See, for example, the US Postmaster's comments:

“Research tells us that within the next 10 years, the infrastructure, security, and public acceptance issues that now limit electronic diversion (of communications currently sent as first class mail) will eventually be solved . . . By the year 2020, there will be so many ways to communicate, advertise and ship merchandise, the monopoly will simply be irrelevant.” Business Week (1998)

postal operator are are bill settlement services and other payment services. It still retains some competitive edge in these areas due to locational advantages (convenience) that are partly derived from the implementation of universal service policy in the past. Another reason is the presence of entry barriers in setting-up bank branches. These entry barriers can be both financial (set-up cost) and regulatory (central bank approval is required).

What changes will the new economy bring? Today, we are already experiencing the impact of ICT technologies on the delivery of financial services. Consolidation and integration of financial services is not new - different types of payment transactions can be effected via banks today. (Note that the competitors of post offices will be financial institutions). It is likely that more financial transactions including payment services will be carried out via the internet. What this implies is a reduction in the demand for payment services offered by the incumbent postal operator. This is partly due to the fact that unlike financial institutions post offices lack the full range of financial services that would enable them to offer integrated financial services such as movement of funds between different types of accounts and for different purposes such as bill settlements.

4 Regulatory Challenges

In analyzing the impact of the new economy on the regulation of postal services, we ought to begin with an analysis of the traditional arguments for postal service regulation. These are usually couched in terms of the presence of market failures such as natural monopoly and the need to meet universal service obligations.

In most countries the incumbent postal operator is given monopoly rights over the delivery of mail of a certain class.¹⁵ Such policies pertaining to “reserved service” are usually implemented in cognizance of two factors, namely, the presence of scale economies (or natural monopoly) and universal services. In this regard, efforts to reform the postal services sector is not very different from that observed in the utility sectors such as power and telecommunications. Reform initiatives along what we have seen in these other sectors recommend a structural separation of the natural monopoly segment (the final delivery segment in the case of postal services) and the introduction of an access regime. The other segments can be liberalized by opening them up

¹⁵In Malaysia, this refers to delivery of letters up to two kilograms.

to entry.

The universal services argument in the postal sector regards the granting of monopoly rights as a necessary policy to ensure that the monopoly firm is able to cross-subsidize services below cost (such as mail delivery in the rural areas). The reform recommendation for this problem is to raise the funds required for universal services in a way that does not distort competition and then allocate the contracts for universal service delivery via an auction mechanism.

Is there a need to re-examine these regulatory issues in the new economy? The answer to this question is yes. We explore some of these issues here.

Universal Services

As the role of postal service for the purpose of communications declines, the problem of universal services will change. The focus of regulation will shift from universal access to mail delivery services to universal access to the internet. The case for doing this is reinforced by the presence of network effects i.e. when more people prefer to contact others or be contacted by others via the internet. It has been suggested that in order to serve such needs, post offices can offer internet access for those who have no such facilities at home (e.g. in rural areas). This would be similar to privately operated cyber-cafes that are abundant in urban areas. There is a difference though, between such internet access facilities and mail delivery services - there is less scale economies in internet access facilities and the investment cost is lower as well. In the case of transportation / delivery, the issue of universal services will remain pertinent.

Natural Monopoly

Earlier, we identified the final delivery component as a natural monopoly. In the case of information goods, if these goods are delivered via the internet, the postal services will be bypassed altogether - making the issue of natural monopoly in postal services a non-issue. That said, not all goods transacted over the internet are information goods. OECD (1999a) estimates that close to 90 per cent of the e-commerce revenues between 1995-1997 consist of B2B transactions which deals almost entirely with non-information goods. Hence, the debate on vertical separation of the natural monopoly component will continue to be a relevant one under the new economy.

Duplicate Investments

Vertical integration and investments in the delivery networks by private

postal operators raise some interesting regulatory issues. Such developments are akin to duplication of existing delivery networks owned by the incumbent postal operator. It is not clear that these duplications are socially wasteful especially when differences in operational efficiencies between the incumbent postal operator and these firms exist. Furthermore, it dilutes the incumbent's dominance in the delivery network market. This would be an alternative to implementing vertical separation of final delivery and putting in place an access regime. Finally, the notion of delivery network need to be looked at a more global scale. Doing so may give us an opposite picture - private parcel and express delivery firms such as UPS and FedEx have a larger delivery network compared to the incumbent postal operator.

Market Power

Finally, due to the importance of network effects in delivery services, the issue of market power will become an important area of regulation in postal services. Postal service operators with a larger delivery network will gain significant advantage over its rivals. In addressing this problem, regulators will again encounter difficulties in formulating an appropriate definition of the market (e.g. delayed vs. express, global vs. local etc.). Furthermore, the postal regulator's job in this respect is made more difficult in the absence of a national competition policy.

5 Conclusion

The new economy entails fundamental transformations in the way we communicate with each other as well as how commercial transactions are carried out and consumated. The advent of the internet will reduce the role that postal services has played in communications. In the area of product delivery, since the bulk of goods transacted over the internet are of the non-information good type, postal services will continue to be relevant. However, the incumbent postal operator will operate in an intensely competitive environment. In the area of regulation, traditional concerns will remain valid in the new economy. However, in some cases such as universal services, the new economy will bring about a subtle shift change in regulatory focus. Network effects, which are amplified in the new economy, will invite regulatory scrutiny on issues such as market power.

References

- Business Week (1998). The U.S. Post Office Girds for Email Competition. 26 January.
- Coyle, D. (1997). *The Weightless World*. MIT Press, Cambridge, MA.
- Economist (2000). A Survey of the New Economy. 23 September.
- Fraumeni, B. (2001). E-Commerce: Measurement and Measurement Issues. *American Economic Review*, **91**(2), 318–322.
- OECD (1999a). *The Economic and Social Impact of Electronic Commerce*. OECD, Paris.
- OECD (1999b). *Promoting Competition in Postal Services*. OECD, Paris.
- OECD (2001). *A New Economy? The Changing Role of Innovation and Information Technology in Growth*. OECD, Paris.
- UNDP (2001). *Human Development Report 2001*. Oxford University Press, Cambridge, MA.
- Varian, H. (1998). Markets for Information Goods. Mimeo.