GUIDED COMPETITION IN SINGAPORE’S TELECOMMUNICATIONS INDUSTRY:
IMPLICATIONS FOR INFRASTRUCTURE DEVELOPMENT

Extended Abstract

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Submitted to the Consortium for Research on Telecommunications Policy and Strategy for its Fourth Annual Conference to be held at Ann Arbor in June 1998
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Introduction

Singapore’s telecommunications infrastructure and services have often been identified as among the most effective and cost efficient in the world, matching or exceeding in many areas, the infrastructure and telecommunications services in advanced countries (Carrel, 1991; Pyramid Research, 1994; Telecom Strategy and Research, 1990). This state has been achieved despite two characteristics that in theory should have led to less efficient outcomes, and which in practice have been observed to have done so. These characteristics are the absence of competition and ownership by the government of the monopoly telecommunications service provider.

Singapore’s small size, dense population, and heavily-built up nature severely limit the size of the market, and the number of service providers that can operate efficiently and profitably, notwithstanding recent technological advances. The country therefore had only one service provider until 1997, when limited competition was introduced through the entry of a second mobile phone service provider. Despite having monopoly control over the market, the wholly government owned service provider (SingTel) achieved a high degree of success developing an infrastructure that is equal to those in advanced nations, while profitably providing services at prices that are rated the lowest in Asia (Asian Wall Street Journal, 1997). These results are unusual given the relatively poor performance of government-owned and monopoly telecommunications service providers.

Previous studies have attributed SingTel’s unusual performance to its effective strategy and to its efficient supervision by the Telecommunications Authority of Singapore (TAS),
the government supervisory organization (Singh, 1995; Toh & Low, 1990). This paper extends these analysis by discussing recent developments in the Singapore telecommunications industry, particularly the introduction of competition. This paper attributes much of the recent development in Singapore’s telecommunications infrastructure to actual and potential competition within the market, and to inter-nation competition. Economic and other levels of competition at the inter-nation level are also identified as having an important impact on telecommunications firms’ performance, and on the type and level of infrastructure investments undertaken. In the process, this paper suggests that governmental involvement and direction will not necessarily lead to negative outcomes, and may be necessary to ensure that non-competitive markets operate with some measure of efficiency.

**Background**

Singapore has enjoyed strong and consistent economic success over the last three decades. Annual growth of 8.25% in real GDP per year between 1960 and the early 1990s allowed Singapore to grow from an underdeveloped nation in the late 1950s to the fringe of becoming a fully developed nation. Through this growth, Singapore has achieved a GNP per capita (adjusted for purchasing power parity) that is the sixth highest in the world (World Economic Forum, 1997), high standards of living, and a physical infrastructure that meets world benchmarks. The reasons for this success are numerous, but important factors include liberal trade and investment policies, heavy investments by MNCs, consistent economic policies, and a high priority on national economic growth. The underlying reasons for the success of these policies and rapid growth of the economy are the government’s industrial policies and its effective management of the economy.

The high priority placed on economic growth, the limited resources available and the small scale of the economy and country encouraged the government to manage the
economy to a high degree. This management, however, has not always taken the form of direct intervention or replacement of the market, as has been common in many countries. In fact, the government has resorted to direct intervention only if other approaches have not worked. Therefore, despite a reputation for a somewhat authoritarian approach and for heavy involvement in the economy, the Singapore government has encouraged a fairly liberal and open economy. Its basic approach may be described as comprising three levels of participation as follows:

**Infrastructure.** The primary approach is for the government to provide a world class infrastructure, so as to make it attractive and profitable for businesses to operate in Singapore.

**Incentives.** In the event that the infrastructure is inadequate to attract the desired level or type of businesses, direct incentives are offered to attract the required activities.

**Intervention.** If infrastructure and incentives are not sufficient, the government will intervene directly to undertake the type of activities desired. Intervention is usually through the establishment of a government corporation to undertake the activity or by directing an existing government corporation to enter the targeted businesses.

As part of its formal plan for long term development, the government developed a Singapore 2000 vision, of which three major strategic thrusts are highlighted here:

**International hub 2000.** This aims to exploit Singapore’s strategic location to make it a hub for the region in several areas, including communications and information, financial services, trade, logistics, and technology and engineering services.

**Information technology 2000.** The key focus of this plan is to develop a well integrated and extensive national information infrastructure based on advanced information technology.
Regionalisation 2000. The strategy encourages Singapore and foreign businesses located here to expand operations into the region, so as to be able to participate in rapid regional growth and to allow the economy to outgrow the constraints imposed by its small size.

It is clear that the government’s economic policies and the national strategic plan both require the development of a high quality physical infrastructure, one that is particularly strong in the area of telecommunications and information technology. Consequently, a high priority has been placed on developing the infrastructure ahead of needs and to invest early in the exploitation of emerging but proven technologies. The result is that Singapore has been rated as having the best infrastructure in the world for business purposes.

Competition And Telecommunications Infrastructure

Analyses of the value of competition in the development of telecommunications infrastructures have usually focused on the positive impact of competitive forces at the service provider level. The basic and almost unchallenged argument is that competitive markets provide better outcomes than non-competitive markets, a position that has been well established in markets that can accommodate competition. However two related issues have not drawn adequate attention.

First, how can the benefits of competition be introduced to markets which because of their size cannot efficiently accommodate more than one service provider? The assumption appears to be that in such instances, strong regulatory control is needed to ensure the efficiency of the service provider, but that the likely outcome will still be a relatively high degree of inefficiency. This argument is based on the strong presumption of inefficiency which characterizes research on government corporations (Sikorski,
1993), a presumption that is well supported by extensive research demonstrating poor performance relative to private corporations.

Second, what is the impact of inter-nation competition on the development of the national telecommunications infrastructure? Nations increasingly compete on several dimensions for their share of global trade, foreign direct investment, and technology development and transfer. This level of competition has not received much attention in the study of telecommunications development, which is surprising given the attention paid to establishing the relationship between telecommunications and national development. It is likely that competition for FDI, for example, has an important impact on many aspects of telecommunications within a state. Impact on infrastructure development is likely to be particularly significant.

Both of these issues will be the focus of this paper. The full paper will develop the argument that it is possible to introduce elements of competitive pressures into a non-competitive market in such a manner as to avoid excessive regulation and to ensure close-to-competitive-market outcomes. It will also discuss the impact of inter-nation competition, and demonstrate that such competition has strong impact on within-country telecommunications policies and infrastructure. Further, such competition can have some of the same impact on service providers that inter-firm competition can have. Finally, using the analogy of inter-nation competition, the paper will also examine another dimension of inter-nation influence – the transmission of cultural and social values and practices – and how these can significantly impact infrastructure level issues.

This rest of this paper will present briefly the main issues that will form the core of the final paper.
Competition in the Singapore Telecommunications Industry

There has been a clear trend among developing countries to move towards deregulation, liberalization and the introduction of competition in their telecommunications markets, in an effort to improve infrastructure while conserving scarce public funds. This trend has occurred despite the belief that key infrastructure should be owned and managed by the government for reasons of national development and security. Reflecting this view, many Asian countries have introduced competition in their telecommunications sectors without privatization of state operators, and while only partially liberalizing the domestic market. Entry has generally been restricted to foreign firms, who have only been allowed to participate with minority stakes in partnerships with domestic firms. Singapore has adopted policies which are broadly consistent with these trends.

Singapore’s telecommunications infrastructure has been widely recognized as being among the best and most cost effective in Asia, and as being on par to those of most developed countries (Asian Wall Street Journal, 1997). Despite having only one government owned fixed and mobile service provider, SingTel, Singapore achieved high rates of penetration of both services by the mid-1990s. SingTel was able to provide high quality services based on leading edge technology, at prices that allowed rapid expansion of the market, while achieving high rates of profitability. As there was an almost total absence of competition, the efficient development of a high quality infrastructure is somewhat unusual. One of the important reasons for this outcome is efficient management of service providers and regulators by the government (Singh, 1995; Singh & Ang 1997).

Key elements of this management involve benchmarking global service providers to establish operating and pricing standards for SingTel, establishing high profitability and performance targets, and placing high demands on the core of carefully selected senior
executives running telecommunications and other government operations.\(^1\) Further, the partial listing of SingTel on the Singapore Stock Exchange increased external pressures for performance on the firm. Finally, expansion of operations outside Singapore into competitive markets further pressured SingTel to improve its operations.\(^2\) More indirectly, the entry of callback services into the market placed great pressure on SingTel to reduce its IDD rates.\(^3\) All of these actions essentially served to partially introduce the pressures of competition on the single service provider. While these pressures were clearly less than those of a competitive market, the state of technology and the associated minimum efficient scale required prevented the introduction of competition.

With mobile phone technology permitting efficient operations at a smaller scale, the government issued a license for an additional mobile phone service provider in 1995.\(^4\) This decision reflected global trends of deregulation and increased competition, and the government’s desire for SingTel to become more efficient in preparation for international competition and expansion. MobileOne, a consortium of two foreign firms (Cable & Wireless of UK, and its partially owned subsidiary HongKong Telecoms) and two local firms (newspaper publisher SPH and the diversified, government linked Keppel Corporation) commenced operations in April 1997. The introduction of competition had the dramatic results usually associated with the introduction of competition in a previously protected market. The market expanded rapidly, MobileOne captured a

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\(^1\) The high pressure to succeed and strong competition among this carefully selected core of senior executives throughout the government essentially replicates some of the pressures of competition among the firms they lead. Since many of these firms do not actually face strong competition, competition among chief executives creates competition across industries, with positive impact at the firm performance.

\(^2\) By mid-1997, SingTel had investments in 52 telecommunications ventures in 21 countries. With few exceptions, these ventures have not been profitable.

\(^3\) Callback services cannot be promoted in Singapore. However, even limited advertising in foreign publications sold in Singapore have attracted many uses. This was a major factor in SingTel’s reduction of its prices. These rates have fallen much faster in the last two years than before the entry of callback services.
significant marketshare (see table 1), prices declined by between 50% and 70% within a year, and many new services were introduced. In the process, the mobile phone penetration rate had risen from 14% at the start of 1997 to 24% at year-end.

Table 1: Singapore Mobile Phone Market: Size and Marketshares

<table>
<thead>
<tr>
<th>Month Ending</th>
<th>SingTel Subscribers</th>
<th>MobileOne Subscribers</th>
<th>Total Subscribers</th>
</tr>
</thead>
<tbody>
<tr>
<td>December 1996</td>
<td>280,000</td>
<td>-</td>
<td>280,000</td>
</tr>
<tr>
<td>January 1997</td>
<td>414,000</td>
<td>-</td>
<td>414,000</td>
</tr>
<tr>
<td>February</td>
<td>423,000</td>
<td>-</td>
<td>423,000</td>
</tr>
<tr>
<td>March</td>
<td>430,000</td>
<td>-</td>
<td>430,000</td>
</tr>
<tr>
<td>April</td>
<td>445,000</td>
<td>35,000</td>
<td>480,000</td>
</tr>
<tr>
<td>May</td>
<td>460,000</td>
<td>50,000</td>
<td>510,000</td>
</tr>
<tr>
<td>June</td>
<td>N.A.</td>
<td>N.A.</td>
<td>545,000</td>
</tr>
<tr>
<td>July</td>
<td>N.A.</td>
<td>60,000</td>
<td>582,000</td>
</tr>
<tr>
<td>August</td>
<td>N.A.</td>
<td>N.A.</td>
<td>605,000</td>
</tr>
<tr>
<td>September</td>
<td>N.A.</td>
<td>N.A.</td>
<td>640,000</td>
</tr>
<tr>
<td>October</td>
<td>550,000</td>
<td>100,000</td>
<td>650,000</td>
</tr>
<tr>
<td>November</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
</tr>
<tr>
<td>December</td>
<td>593,000</td>
<td>150,000</td>
<td>743,000.</td>
</tr>
</tbody>
</table>

The growth of mobile phone services is consistent with the view that competition played an important part in expanding the market and suggests that no matter how efficient a monopolist is, it is unlikely to achieve the efficient outcomes of competitive markets. However, it is noteworthy that market growth and this outcome were achieved with one service provider being 80% owned by the government and the other being minority-owned by a government linked corporation. The indirect involvement of the government in both players in the industry illustrates Singapore’s approach of allowing competition, while providing guidance that will result in outcomes that are positive from the national perspective. The TAS took considerable efforts to ensure that both players would remain viable and profitable, and would compete without jeopardizing the integrity of the national telecommunications network. Policies on number portability and interconnect charges for example, appeared to be finely balanced so as not to offer excessive

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4 The mobile service provider was able to commence operations with an investment of less than S$300m, much less than the S$1 billion estimated for a fixed line provider. Singapore’s
advantage to either player (TAS, 1997). This approach to guided competition is illustrated by the chief regulator of the telecommunications industry in Singapore:

“One of the key challenges for TAS will be how to make sure that all of these competitive forces happen in a systematic and orderly manner. Not just for orderliness’ sake. But I think the implication would be that if you have systematic competition it would lead to long-term benefits for consumers as opposed to a very laissez faire and unsystematic manner.” (Business Times, 1997)

Inter-nation Competition

The view that the telecommunications infrastructure significantly impacts economic growth appears to be widely accepted among the countries of Southeast Asia, and is perhaps most widely accepted in Singapore. This is reflected in the heavy importance accorded by the government to the development of world class IT and telecommunications infrastructures. This priority, and the related strategy of targeting IT and related sectors as priority growth industries for Singapore, largely account for the heavy investments that the government has made in the telecommunications infrastructure. While this position is not unusual among developing countries, Singapore has perhaps placed more importance on developing leading edge systems than any other country. More unusually, Singapore places a high degree of importance on possessing an infrastructure that is superior to that of “competitor nations”. This is well illustrated with the impact that Malaysia’s launch of the Multimedia Super Corridor (MSC) had on Singapore.

The MSC is essentially an effort to build a large scale and purpose designed, highly integrated broadband IT infrastructure to serve as the basis for new business, government, health, social and education institutions and operations. Though not

telecommunications sales were valued at S$4 billion in 1997. (In April 1998, US$1=S$1.6).
conceptually novel, this effort was well packed, well supported by Malaysia’s top leaders, and drew the support of world leading IT firms. Though Singapore had in place a national IT plan that envisaged a similar infrastructure, and had in fact made more progress towards its implementation, the announcement of the MSC was perceived as a threat to Singapore’s position as the leading candidate for IT investments and as the economic hub for the region. This led the Singapore authorities to review and re-launch their IT strategy, and to increase their investment in this effort. Similarly, Malaysia’s liberalization of its mobile phone services may have played a part in encouraging Singapore to do the same. Such competition is particularly important for the Southeast Asian countries, and for Singapore, which aims to maintain its role as the communications and business hub for the region. In general, it is clear that the pressure to stay ahead of “competitor countries” in the economic development race plays a big part in infrastructure decisions. More generally, the drive for rapid growth translates into countries installing superior infrastructures, in the belief that this has a direct payoff.

From a different perspective, the challenges of minimizing foreign social and cultural influences have influenced several aspects of Singapore’s infrastructure. These influences can be evaluated as a different dimension of inter-nation competition, that for cultural independence. An example of such impact is the policy to ban satellite television services in Singapore. Though this may have offered the fastest and most cost effective means for providing increased television and other multimedia services, this option was not adopted as it was believed that satellite based transmission would eventually allow unrestricted access to foreign content. This was viewed as undesirable, as the population would be vulnerable to foreign cultural and social influences. Instead the decision was made to provide optical fibre outlets to every home in the country, to provide access to cable television and other multimedia applications. This alternative is also consistent with Singapore’s IT strategy, which is based on the
concept of an optical fibre based broadband backbone throughout the country. Optical fibre cables had been laid “kerbside” by the early 1990s for the telecommunications network, and were owned by SingTel. The partially government-owned cable television provider (SCV) would lay and own the links from there into each home. By mid 1998, more than 85% of all homes in Singapore will be wired, and essentially all by mid-1999. Though it has been argued that the nation has made a costly investment in a fixed asset that may soon be overtaken by cheaper and more flexible technologies, the less technologically advanced alternative was viewed as superior for offering lower total financial and social costs.

The need to integrated the cable and telephone networks on the same backbone is also a central aspect of the government’s plan to have a nation-wide broadband infrastructure providing a wide range of interactive multimedia services to all homes, offices and institutions in the country. The network, Singapore One, which entered its pilot testing phase in June 1997, is based on the same optical fibre network to be used for telephone and cable television services. The integration of the telephone and cable television services will enhance the value and range of the network’s services and increase its utilization. This network is being developed with a combination of government direction, ownership of the backbone network, and regulation of content, and private sector development of content and services. Though directly involved in the establishment and management of the network, the government has been minimally involved in content development, probably in recognition of its limitations in this area. Given the uncertain economic viability of the venture, government subsidies have been offered to attract the private firms. This level of government involvement is justified on the basis that the Singapore One network will enhance Singapore’s international competitiveness and help it develop new technologies for its IT industry.
At a different level, pressure from external organizations has also impacted Singapore’s plans for liberalizing its telecommunications market. In April 1996, Singapore announced that it would bring forward the end of SingTel’s exclusive fixed line license by five years, to 2002 (later brought forward to 2000). This was widely interpreted as a reaction to pressure from the WTO, which was to hold its first conference in Singapore at the end of 1996.

In 1997, it was decided that up to two additional licenses each would be issued in 2000 for mobile, and for full domestic and international operations. The primary factor driving this liberalization appears to have been the recognition that competition would have the same positive benefits to the fixed line market as it did in the mobile phone market. The failure to do this would, on the other hand, handicap the economy with higher prices than in competitor economies with more competitive telecommunications industries. However, the decision to issue the two basic licenses for telecommunications services (which would allow full domestic and international services) recognized the national interest in not duplicating the existing access networks, particularly the high capacity cable network. The regulatory authority has therefore indicated that it would mandate access to SingTel’s and SCV’s fibre network for the new service providers. While allowing for the provider to undertake minimal investments in facilities, the tender document also encouraged bids based on new and innovative technologies that would compete with or advance the existing infrastructure. All three finalist for the Public Basic Telecommunications Service licenses included one government linked corporation, while two also included one other government organization. These points again illustrate that providing the framework for competition while allowing for cooperation as required, characterizes Singapore’s approach to managing the telecommunications industry.

A similar approach was taken in the provision of internet services. The strategy of making Singapore an intelligent island and a leader in IT suggested the need to
maximize internet access and utilization. However, the need to minimize the negative influences of the internet required some measure of control. The strategy adopted was to allow several service providers, all of which had strong links to the government or government linked corporations, and easy access, while introducing new regulations to discourage uses that were viewed as negative. The competing interests in this and the earlier example of cable television have been the need to establish a modern infrastructure to aid the nation’s development while minimizing the cost of the infrastructure and maximizing its long term utility, against the need to maintain internal cultural balance.

**Preliminary Conclusions**

On the basis of this discussion, the following preliminary conclusions can be drawn:

The concept of competition must be broadened to include indirect competitors. The nature of telecommunications is such that the pressures of competition can be transmitted even without the direct participation of competitive firms in the specific market. Evaluation of the competitiveness of markets must factor the impact of these indirect forces. In some respects, this is consistent with the basic premise of one of the most widely used models in strategy, which argues that the competition in an industry depends on the current competitors in the industry, and on other forces that constrain the flexibility of these competitors (Porter, 1980).

It is also possible to transmit some of the effects of competition through the establishment of competitive performance benchmarks. Supervision of service providers has often focused on pricing of services, capping rates of returns, and the approval process for price changes. It may be more effective for supervision to focus on setting competitive benchmarks for minimum rates of return, the
establishment of maximum pricing levels and the setting of minimum service standards. This approach, which reverses the procedures commonly adopted by many telecommunications regulators, provides service providers the flexibility to deal with the rapidly changing telecommunications and IT technologies and industries. Investment and technology decisions based on firms’ evaluation of the best use of their resources are more likely to be efficient in rapidly changing environments than regulators’ guidelines.

The government may play a positive role in the development of telecommunications in a country, in part because of deliberate attempts to replicate market pressures in a non-competitive market. In most countries, governments deliberately or otherwise, guide the nature of competition in the telecommunications industry. This guidance, if effective, can balance national development needs against the most efficient outcomes offered by competitive markets.

It is also clear that non-technological or financial factors can be important influences on telecommunications matters. Social and cultural considerations may directly impact infrastructure decisions. Though these circumstances may not be typical of the large US market, they are common in the smaller and less well developed countries. The example of Singapore demonstrates that even in these conditions, a relatively efficient solution can be obtained.

It is important to recognize that competition among countries has major impact on telecommunication and IT infrastructure decisions. For many developing countries, this factor may be as important a driver of infrastructure decisions as service provider efficiency and availability of resources for investment, for example. While consistent with the long established argument that telecommunications and economic growth are
closely related, the impact of inter-nation competition is somewhat different, and has not been adequately emphasized. The impact of these factors can significantly promote investments in telecommunications and IT infrastructure, while constraining the nature of the investments.

REFERENCES


Business Times (1 October 1997). Win-win For Everyone In Mobile Paging Markets.


Telecom Strategy and Research, (1990), Singapore Telecommunications. Chichester, England: TRC.
