The Regulation of Telecommunications Industries in Small Economies

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12th January 2006

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Acknowledgements

The authors would like to express their thanks to the many people who have helped in the research by completing an onerous questionnaire, providing much valuable information on the special unique challenges facing the telecommunications industry in small economies. We also wish to thank Cable & Wireless plc for their financial and logistical support.

TABLE OF CONTENTS

1. Executive Summary

The telecoms market is facing a fundamental discontinuity as the industry changes from one dominated by circuit switched voice services on narrowband to an always-on broadband world with Internet Protocol (IP) as the principal method of transferring information. Historic market structures, which have required a certain form of regulation, are under threat. There is inevitably a need for new regulatory policies as we enter the post liberalisation phase. Academics and policy makers are reviewing existing regulatory models: for example the UK regulator, Ofcom, has recently completed a strategic review of the telecommunications sector and the European Union will commence its own review in 2006.

At the same time, some small economies, which may have had a high level of protection in the past, are moving towards an open market-economy and are joining international institutions such as the European Union (e.g. Malta). Many small economies have tended to "import" regulatory and competition policy from larger countries, such as the EU and USA. But these policies have not been designed for the special characteristics of small economies and so may not be appropriate.

This paper explores the need for regulatory proportionality for the telecommunications sector in small economies. The core question we address is:

> *Is regulation designed to address communications markets in the EU and the USA necessarily appropriate to small economies or does regulation, where it is necessary, need to be adapted to meet the special characteristics of smallness?*

A small economy cannot be described in a one-dimensional manner. Rather, there are several characteristics which together define a small economy. These can be broadly classified under three general categories:

- Economic
  - Small domestic market compared with efficient scales of production
  - Homogeneity of the market
  - Small human and natural resource pool
  - Isolation and high transport costs
  - Economic and natural vulnerability
- Political
  - Small business and political elite
- Social
  - Social cohesion and institutional flexibility.

We find that a core challenge for policy makers in small economies is weighing up the trade-off between different forms of efficiency. One of the leading academics on the study of small economies, Prof. Michel Gal, suggests that competition and regulatory policy in small economies should serve only one master: economic efficiency. Broader social goals should be pursued through other policies. Whilst we believe this broadly to be true, it is not a straightforward objective because economic efficiency itself has three dimensions – allocative efficiency, productive efficiency, and dynamic efficiency[1] - and the achievement of one of these, e.g. productive efficiency, may be at the expense of another, e.g. allocative efficiency or vice versa. In a small economy, firms may only be able to produce at lowest cost (productive efficiency) if there are few firms in the market, which suggests that regulators could be unconcerned about increased market concentration (i.e. fewer firms) in the market. However, the consequent lessening of competition may result in allocative efficiency losses if it results in prices rising above cost.

[1] Economics recognises three forms of efficiency. "Allocative efficiency" occurs when prices are in line with costs and so demand for a product is not distorted through prices being set above or below cost. "Productive efficiency" refers to products being produced at the lowest possible cost for a given level of output. "Dynamic efficiency" occurs over a longer period and refers to correct incentives for investment and product/process innovation.

For telecommunications regulators this raises a specific question: should the regulator issue licences to anyone who asks and let the market find the equilibrium number of suppliers, but risk inefficient entry and stranded assets of firms that fail, which a small economy might not be able to afford? Or should it attempt to restrict market entry to an optimum number of licences which will allow sustainable competition but risk a degree of market power?

Another central problem for small economies is the lack of skilled human resources and the smallness of the political, business and social elite. Lack of resources may lead to regulatory authorities being understaffed both in numbers and skills. A small elite can also contribute to the economic characteristics of a small economy as decision making tends to be restricted to a tight knit group without the same checks and balances or governance which exists in larger jurisdictions.

Regulatory policy in small economies needs to have clear goals and economic efficiency should be a primary objective. Regulatory and competition authorities also need to develop an understanding of the efficiency dynamics of small economies and make sure policy is sensitive to these. There is also a clear need for policy makers to develop institutions which can cope with the lack of resource.

To achieve this, we propose a seven point agenda for telecommunications regulation in small economies:

i) Regulation and competition policy should start with the unique characteristics of the economy to be regulated rather than with the import of a model developed elsewhere.
ii) Behavioural remedies on a small number of players may be more efficient than opening up the market too widely.
iii) Competition authorities and regulators should give at least equal weight to producer and consumer surplus when considering competition problems.
iv) Regulatory cost savings can be achieved by teaming up with neighbours and/or similar economies.
v) A proper legal basis is vital for an effective regulatory system, along with the appropriate checks and balances.
vi) Regulation should be embedded in the institutions of the economy.
vii) Open trade policies should be used to encourage investment.

2. Introduction

Telecommunications markets around the world, in large and small economies alike, are facing a fundamental discontinuity brought on by the move from traditional circuit switched networks carrying narrowband voice traffic, to ones built on IP which can transmit both voice and data services. This is leading to a change in the economics of the telecommunications industry and a resultant shift in market structure. Regulatory policy within the telecommunication sector was originally designed for markets dominated by an incumbent which owned and controlled the access bottleneck and enjoyed market power in most markets. However, the change in market structure requires a change in regulatory thinking.

In general, the economic foundations for regulatory policy and competition law in most small economies[2] have been derived from practice in the European Union or United States. However, as more small economies open their markets, move towards a market-economy and join international institutions such as the European Union (e.g. Malta), economists and bodies such as the Organisation for Economic Co-operation and Development (OECD) are beginning to question whether competition and regulation policy in small economies should be the same as in large economies or whether there are unique characteristics of small economies which require a different approach to a different set of problems.

In this paper we seek to take this discussion forward and apply it specifically to the electronic communications sector in small economies. The core question we address is:

> *Is regulation developed to address communications markets in the EU and the USA necessarily appropriate to small economies or does regulation, where it is necessary, need to be adapted to meet the special characteristics of smallness?*

Competition policy and ex ante regulation is, in general, designed to address two specific problems: abuse of a dominant position and horizontal or vertical agreements which limit competition. The term "dominant position" was defined by the European Court of Justice in the *Hoffman-LaRoche* case:

> *The dominant position… relates to a position of economic strength enjoyed by an undertaking, which enables it to prevent effective competition being maintained on the relevant market by affording it the power to behave to an appreciable extent independently of its competitors, its customers and ultimately of its consumers."*

The holding of a dominant position is not, in itself, regarded as detrimental, rather it is the abuse of such a position that causes economic problems. Abuse was also defined in the *Hoffman-LaRoche* case as:

> *[A behaviour] which, through recourse to methods different from those which condition normal competition in products or services on the basis of the transactions of commercial operations, has the effect of hindering the maintenance of the degree of competition still existing in the market or the growth of that competition.*

Telecommunications in both large and small economies, and in both developed and developing economies, is generally in transition from monopoly to competition. The ex-monopoly incumbent is often in a dominant position during this transition period, in particular in wholesale markets where it provides key inputs to its retail competitors. Telecommunications regulation in the EU and the USA has largely been designed to prevent the incumbent from abusing its dominant position by proscribing certain behaviours which may be regarded as abusive.

[2] In accordance with common usage in the literature, this paper uses "economy" or "state" as a substitute for "country" in order to emphasise that it takes no position concerning the sovereignty of any governments. Moreover, use of the term *economy* to describe a political unit does not imply that its political borders constitute a competitively significant *market*. In addition, the term "small jurisdiction" is often used when discussing small geographical entities. This term includes small independent states as well as parts of larger states with a degree of administrative autonomy, and island provinces or regions with an isolated geographical market. In this paper, small economies, small states and small jurisdictions are used interchangeably.

Merger policy in large economies is primarily designed to prevent firms merging where the post-merger undertaking would gain a dominant position.

This paper is structured as follows. Section 3 explores some of the existing literature on small economies to develop a multi-dimensional definition of a small economy through a number of "stylised facts." Section 4 discusses economic efficiency and the trade-offs between allocative, productive and dynamic efficiency which may have to be made in a small economy but which would not be so stark in a larger economy. These trade-offs have fundamental implications for policy makers. Section 5 discusses a number of policy responses. Each response is looked at from both a theoretical perspective and an empirical analysis of some of the responses taken by small economies. This section draws on a survey of telecommunications regulatory departments undertaken for this project. Finally, Section 6 sets out an agenda for regulatory policy for the electronic communications sector in small economies.

3. Characteristics of Small Economies

There are various ways to define a small economy, the most obvious of which relate to measures such as population size, geographical size, or gross domestic product. However, a more complete definition should not be limited to one feature but include a number of characteristics. These characteristics can be described as 'stylised facts'. Of course, the importance of any particular stylised fact may differ in each specific instance. For example, the relevance of a feature may depend on whether a small economy is surrounded by large, dynamic, developed economies or by small, undeveloped economies. Whether the economy has geographic "barriers" such as oceans and mountains may also be relevant. It is also often the case that small economies are developing economies with special institutional and cultural conditions that may, at least during the early years of a competition regime, call for special competition rules or means of enforcement. Where relevant, in this paper such issues will be mentioned, however, for the most part this paper will focus specifically on small economy issues, regardless of the state of economic development. In any case, we can thus see that smallness is always a matter of degree.

In the rest of this section we discuss a number of characteristics or 'stylised facts' of small economies that have been discussed in the literature. These can be broadly classified under three general categories:

- Economic
  - Small domestic market compared with efficient scales of production
  - Homogeneity of the market
  - Small human and natural resource pool
  - Isolation and high transport costs
  - Economic and natural vulnerability
- Political
  - Small business and political elite
- Social
  - High social cohesion and institutional flexibility

In the subsequent sections we will consider the implications of these characteristics for economic efficiency and for regulation and competition policy, specifically in relation to telecommunications.

In February 2005 a group of small economies[3] submitted to the World Trade Organisation a list of characteristics and trade problems faced by small economies (WTO 2005). There is a substantial degree of similarity between the characteristics described by this group of countries and the stylised facts we have found.

While smallness of a country is sometimes a consideration in theoretical and empirical economic research, the literature specifically focusing on small economies is quite limited. The most important works on which this review draws upon are Gal (2001a,b; 2003; 2004), papers from the OECD Global Forum on Competition (OECD, 2001a,b,c), Evans and Hughes (2003), Briguglio (1995) and Briguglio and Buttigied (2004). These papers discuss general competition issues in small economies and do not concentrate on a specific sector.

3.1. Small Domestic Market Compared with Efficient Scales of Production

Undoubtedly, the main characteristic of a small economy, as its name indicates, is the smallness of its domestic markets. This stylised fact probably has the most focus of attention in the literature. The definition of market size used in the literature relates the ratio of the output size of the relevant market (the output that would be demanded at a price just sufficient to cover minimum unit costs) to the size of a unit of production that is just sufficiently large to achieve lowest average costs of production (the

[3] Antigua and Barbuda, Barbados, Bolivia, Cuba, Dominican Republic, El Salvador, Fiji, Guatemala, Honduras, Jamaica, Mauritius, Mongolia, Nicaragua, Paraguay, Sri Lanka, Trinidad and Tobago

minimum efficient scale or "MES" of production). Naturally, the smaller market demand is, compared with the MES of production, the fewer the number of production units that can operate in the market.

With this focus of small markets, Professor Michel Gal has thus defined a small economy as an "independent sovereign economy that can support only a small number of minimum efficient scale businesses in most of its industries when catering to domestic demand" (Gal, 2001, p.6). As we will see in section 4, this characteristic of small economies has conflicting efficiency implications via its effects on the quality of competition and cost of production.

There are some interesting issues that arise from this definition of small economies:

- *What is a "small" number of minimum efficient scale businesses?* The definition does not reveal what should be regarded as a "small" number of minimum efficient scale businesses. Most likely, the conceptualisation occurs along a continuum and is linked to the competitive implications of concentrated markets (discussed further below). From the theory and empirical work on oligopoly, when the number of competing business drops below five, roughly speaking, the competitive implications of such a concentrated structure induced by smallness typically becomes a concern for competition authorities. The actual "minimum" number of firms may vary according to the product/service market under consideration.

- *Which market and which industries?* The market referred to in Gal's definition is the domestic market. However, in those countries with open international trade, a country of small population may still possibly support a relatively large number of minimum efficient scale businesses in at least some specialty areas. Examples include the Cayman Island in finance and Israel[4] in information technology. Thus while Gal's definition refers to "most of its industries" being concentrated due to scale effects, it needs to be remembered that some industries may not be experiencing the same small market demand conditions (and hence not necessarily fit within the same small economies' policy conclusions discussed later).

- *Link to geographical size of market*. The definition is not constrained by geographic or population size, although there is obviously a link. For small jurisdictions such as the Faro Islands (with a population of approximately 40,000), Jersey (90,000), and Malta (350,000) there is clearly a strong correlation between population, geographic size and the number of supportable minimum efficient scale firms. More generally, there is a well established link between economies with a small population size and industry concentration (monopoly and oligopoly). An example of this is provided by the 1975 study conducted by Scherer et. al. of concentration levels in 12 selected manufacturing industries. They found that industrial concentration in manufacturing tends to increase as the size of an economy's population decreases.

  However, it may also be possible for countries of comparatively large geographic areas but dispersed populations (e.g. Australia, Canada) to be covered by this definition as the regional nature of markets may also lead to concentrated industries.

It should also be noted that minimum efficient economies of scale are not only associated with facility size. For example, in a small market bulk buying is often required to avoid excessive fragmentation of cargoes, especially in the case of raw materials. This can also limit the number of players that can be sustained in the market.

3.2. Small Natural and Human Resource Pool

Perhaps the second most important economic characteristic of a small economy is the size of the human resource pool available. Table 1 shows the population of the economies surveyed for this study. A particular problem is the constraint on the availability of labour, especially skilled labour. This is even further exaggerated by the existence of 'brain drain' where skilled labour migrates to larger economies where greater opportunities are available and wages may be higher.

[4] Israel may be considered a small economy due to its political isolation from other local economies and therefore it displays some of the characteristics of a small economy.

For telecommunication enterprises, finding staff with technical skills may be a particular problem. But just as important for the telecommunications industry is finding the necessary expertise to administer regulatory and competition authorities. Although smaller economies need a smaller number of personnel for such positions, because of the problem of indivisibility in human skills, the number of staff required is not proportionately lower. In fact, the number of personnel and the cost of administration per capita of population are likely to be larger in small economies when compared to larger economies (Briguglio, 2004). It has also been argued that in the allocation of scarce governmental human resources in small economies, higher up the priority list will be technological, scientific and social administration concerns, with regulation and competition authorities taking on a lower priority (OECD 2003b).

Table 1: Populations

Country	Population
Barbados	672,000
Cayman Islands	48,990
Guernsey	56,000
Jamaica	2,626,000
Macao	442,000
Maldives	281,000
St Lucia	160,000

Source: OECD

To the extent that small economies are also small geographically, there is also usually a limited availability of natural resources such as minerals, forests, water, etc. This also opens up the possibility of monopolisation of such resources, again with subsequent efficiency effects discussed further below. As already mentioned, some economies may purposely specialise in the use of their natural and human resources (e.g. oil in Kuwait, IT in Israel) but this channelling of resources can exaggerate even further the concentration of businesses in other industries in the economy.

3.3. Isolation and High Transportation Costs

Many small states and small jurisdictions are also islands, or in some other way isolated, and therefore transportation costs are an additional cost faced by firms within these economies. Additionally, there is typically less competition within these services due to the lack of alternative possibilities (e.g. land transport is not possible). Apart from high per unit cost of transport, insularity may also give rise to additional problems such as time delays and unreliability in transport services. This may require greater warehousing which is another additional cost on production (Briguglio, 2004). In addition, and as previously mentioned, in a small market bulk buying is often required to avoid excessive fragmentation of cargoes, especially in the case of raw materials, and this limits the number of players in that market.

For the telecommunications sector, this may increase the cost of buying network equipment such as cables and routers which have to be imported from distant production facilities rather than produced locally. This is a problem which may be exacerbated if the government places high import tariffs on such equipment. It may also mean that countries are remote from international broadband cable capacity. This is not always the case however. As the table shows Cayman and Guernsey, both highly dependent on financial services, are well served for bandwidth despite the former's geographic remoteness.

Table 2: International Bandwidth: Small Economies

Country	International Internet bandwidth: M/bits per 1,000 population
Barbados	0.65
Cayman Islands	4.39
Guernsey	4.82
Jamaica	0.65
Macao	0.49
Maldives	0.03
St Lucia	0.30

Source: Government websites

3.4. Vulnerability

Small country size often implies, as already mentioned, poor natural resource endowment and low inter-industry linkages, which result in a relatively high import content in relation to Gross Domestic Product (GDP) (Briguglio 1995). In addition, there may be severe limitations on import substitution possibilities (Worrell, 1992). Similarly, a small domestic market may sometimes give rise to a relatively high dependence on exports (Bruguglio, 1995) and therefore on the economic conditions in

the rest of the world. Such states are therefore more vulnerable to the economic cycles of the world economy than larger economies for which the export/import sector is a smaller component of GDP.

In addition, small states are also more vulnerable, in proportionate terms, to the effects of natural disasters such as hurricanes, flood and drought.

The islands of the Eastern Caribbean were heavily dependent on the export of sugar cane and bananas, but recent changes in trade policy have severely reduced or even eliminated these industries altogether. These islands were also dependent on tourism from the USA which was severely reduced by the events of September 11th 2001. The Cayman Islands and the Channel Islands are both dependent on financial services and so vulnerable to downturns in markets far away from their geographic location.

3.5. Homogeneity of the Market

The size of a country may also affect its variety in tastes of consumers. Small economies are more likely to have a more homogenous culture than large economies. However, a key strategy, especially for small businesses, in a modern economy is to differentiate products and services. The effect of a homogeneous market is that there are limited opportunities for businesses to exploit niche markets and compete in a non-price manner. If this possibility is absent then competition is restricted to cost competition, which, as previously mentioned, in a small economy is limited by economies of scale.

3.6. Small Business and Political Elite

A common feature of small economies is the existence of a small and tight-knit political and business elite. This is a natural consequence of the limited pool of human talent and educational resources. As such, political and business leaders are likely to have attended the same schools and universities and are likely to encounter each other very frequently in social and business settings. It is clear that these conditions could have an effect on the formation and implementation of regulation and competition policy. In addition, a small state is also unlikely to have the capability of handling a large number of issues at any time on a political agenda. As such, in a small economy, a successful political policy is likely to be carefully targeted in a very pragmatic manner.

Independent of the political regime, an economy characterised by a small number of business operators makes it easier to maintain cartels and other collusive arrangements when there are strong personal ties that reduce the likelihood of cheating on such arrangements (OECD 2003b). This factor is probably less applicable when foreign entrants are significant market players who do not share the same level of personal ties.

A smaller circle of business and political agents may also be liable to suffer from “group think”. This is a term coined by social psychologist Irving Janis (1972) and occurs when a group makes faulty decisions because group pressures lead to a deterioration of “mental efficiency, reality testing, and moral judgment”. Groups affected by groupthink ignore alternatives and tend to take irrational actions. A group is especially vulnerable to groupthink when its members are similar in background and when the group is insulated from outside opinions. For example, a national attitude about the introduction of competition into an economy, whether positive or negative, can quickly disseminate and become cemented, even if based on poor reasoning or evidence.

National champions are also more likely to be promoted by a small political elite than is typically the case in larger states. Such enterprises are often very important to the national identity and as such may receive favourable treatment in terms of protection from foreign competition. The political elite may also try to protect the national champions from the competition authorities either openly, through legislative means, or indirectly, by affecting the activities of the authorities (OECD 2003b).

The smallness of the political elite can also affect institutions such as competition and regulatory authorities which can become overly influenced by political considerations. Perhaps the worst situation arises when senior personnel in politics, institutions and companies are closely linked and so form a nexus where none is independent of each other.

3.7. Social Cohesion and Institutional Flexibility

It has been argued that small economies are likely to have a greater degree of social cohesion and identity than larger sized economies (Kuznetz, 1960). This may have implications for the degree of institutional and technological flexibility in adapting to new conditions. On the one hand, closer internal ties and greater homogeneity may make it easier to make the social adjustments needed to take advantage of modern technology and economic growth. Indeed, a smaller economy may be able to absorb a new technology more rapidly if the smaller population and geographic size allow network effects to be absorbed quickly and coverage (e.g. mobile phones) to be swiftly implemented[5]. Furthermore, to the extent that necessity is the mother of invention, the imperative of small economies to be flexible may also be a strong innovative force.

On the other hand, larger economies have a breadth and diversity in ideas and opportunities that allow for evolutionary forces to foster new and better services and products. Furthermore, as will be discussed further below, there are more resources to invest in research and a greater potential market to try a greater number of new products in a large economy.

[5] For example, a small island could be covered by a single mobile phone mast.

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4. Efficiency Implications for Small Economies

The unique characteristics of small economies have important efficiency implications for the economy and for regulatory and policy decisions regarding market power, either of existing firms or as a result of merger activity. Indeed our research, and that of other commentators on small economies, suggests that market efficiency implications, and the tension and trade-off between different forms of efficiency, should be central to competition and regulatory policy making in small economies.

Economists typically refer to three standard sources of efficiency. These sources, and their connection to the special characteristics of small economies, can be summarised as follows:

1. *Allocative efficiency* results when prices reflect cost conditions. The small number of firms in a small economy, primarily due to the presence of relatively large minimum efficient scale facilities compared to market demand, can result in the existence of producer market power. This can result in prices being raised above the competitive level. Other small economy influences which can also lead to market power include: the presence of a small business elite (which can assist in collusive behaviour); close and personal business-political relations which can reduce the extent of government and regulatory intervention protecting against the exploitation of market power; and limited natural resources and transportation options which can be more readily monopolised than in larger economies.

2. *Productive efficiency* means that the costs of producing a given level of output are minimised. To the extent that firms cannot operate at their efficient scale, unit costs may be higher than they would be in a larger economy. Furthermore, the barriers to entry in a small economy already discussed and/or the governance arrangements for corporate control in a small economy may reduce the incentives to produce output at the minimum production cost (e.g. due to managerial slack).

3. *Dynamic efficiency* is a longer-term efficiency concept that captures changes and improvements in production methods due to R&D and innovation. Small markets may affect the incentives to, and resources for, innovation and achieving the appropriate level of investment in an economy. The outcome of dynamic efficiency is revealed in allocative and productive efficiency over time.

The most important tension in these results is between achieving greater productive efficiency, via larger plants/operations, versus the greater allocative inefficiency that can result from the subsequent market concentration and rise in market power. As we will discuss further below, this trade-off should be carefully evaluated. The presumption of avoiding market concentration at all costs, which is apparent in merger and anti-trust philosophy in some countries, needs to be carefully examined in light of the potential productive efficiency benefits that large businesses may have for a small economies.

In the rest of this section we elaborate further on the sources and consequences of efficiency effects, including the important tension between allocative and productive efficiency[6]. In the final sub-section of this chapter we develop a model showing the characteristics of small economies, described in Section 3, and their effects on the three sources of efficiency. Readers familiar with the concept of economic efficiency can go directly to Section 4.4.

4.1. Allocative efficiency

To achieve allocative efficiency, prices must reflect cost conditions. In economic terms, allocative efficiency occurs when the cost of producing an extra unit of a good or service – the marginal cost – is equal to the benefit gained from its consumption – the marginal benefit. When a country's resources are allocated in such a way that it is impossible to reallocate factors of production and further increase welfare, then allocative efficiency has been achieved. It is well known in economic theory that the conditions of perfect competition lead to allocative efficiency. However, where competition is weakened due, for example, to a small number of firms in a small market, the

[6] This section has drawn partly upon Evans and Hughes (2003).

possibility arises that these firms can exert market power and raise prices above costs (achieving above-normal profits). Economic theory has long been aware of the welfare losses that this may give rise to in models of monopolistic and oligopolistic markets. The magnitude of the reduction in economic welfare resulting from this distortion is calculated using the concepts of consumer and producer surplus to indicate efficiency: the aggregate of which is the change in total economic welfare.

In Figure 1 we provide a simple illustration of the so-called 'deadweight' welfare loss that arises from prices being above the competitive (or cost) level. The demand curve represents the value of various increments of output. The area below the demand curve but above the unit price represents the 'consumer surplus'. This reflects the fact that consumers receive value (or utility) greater than the price of the good or service (except for the marginal unit). In this diagram, at the original price of Po, this value is represented by the triangle (ABD). Producer surplus is calculated in a symmetric way and represents the revenue received above the marginal cost of the good. This is the net revenue that can be used to cover fixed costs. In this diagram the producer surplus is represented by the triangle BCD.

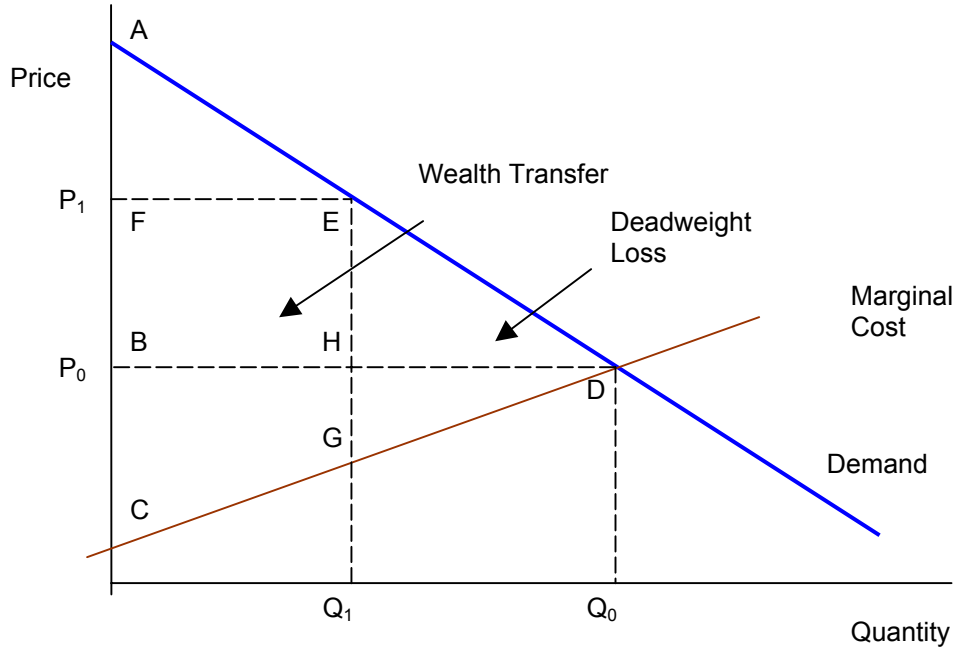


Figure 1. Welfare loss arising from a rise in price above competitive (cost) level

When the price is raised above marginal cost to, say, P_1, due to market power achieved by a monopolist or small number of firms (oligopoly), the consumer surplus shrinks to AFE and producer surplus now rises to FCGE. Note that there is a transfer between consumers and producers of FBHE. If we weigh each group's surplus equally then such a transfer implies no welfare change. However, only part of the original consumer surplus has been transferred to the producers and the consumer surplus represented by the triangle EHD is lost without any compensation. There is a similar loss in producer surplus of HGD. The total of these two lost surpluses is usually called the 'dead-weight loss' and is the welfare lost from market power. There is potential output that it valued greater than its cost but it is not being produced.

In addition to this welfare loss from not operating at the efficient scale, the theory of rent seeking suggests that, in cases where a firm has an ability to capture an oligopoly or monopoly rent, economic agents have an incentive to compete for it. This competition can involve economically wasteful activities such as excessive lobbying, unnecessary litigation or even crime (e.g. bribery).

An additional economic cost of monopoly or oligopoly mark-ups lies in the possibility that it can reduce non-price competition. For example Stigler (1968) and Mussa and Rosen (1978) show that

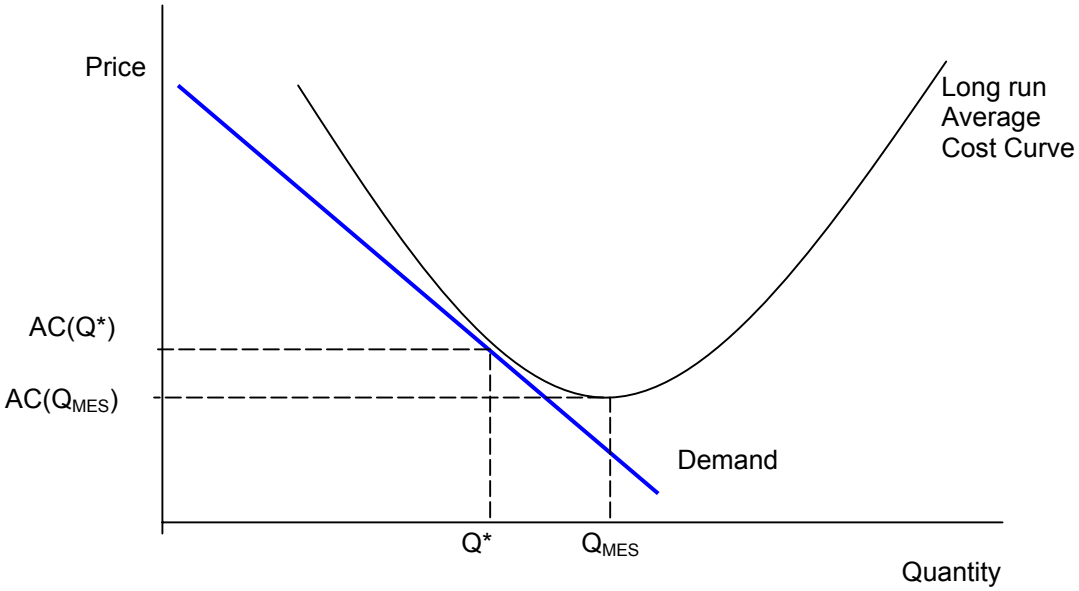
the incentive for a monopolist to restrict quality (i.e. reduce it) remains even if the monopolist has the option of offering both high and low quality versions of a product. While there are empirical difficulties in modelling quality, Bils and Klenow (2002) conclude that quality growth has been an important part of recent economic progress as markets have become more competitive.

4.2. Productive Efficiency

Productive efficiency refers to the minimisation of costs for a given level of output. We have already noted how small domestic markets can lead to difficulties for firms in achieving the minimum efficient scale. The issue posed by diseconomies of scale is illustrated in Figure 2 where the firm's long run average cost curve is drawn so that it reaches its minimum at a relatively large output level (denoted Q_{MES}). With the demand curve given in the figure, the output level that would be demanded at a price just sufficient to cover average cost is given by Q*. As can be seen, this results in a unit cost that is above the minimum unit cost level that can be achieved by operating at a higher capacity level. However, in this case there is insufficient demand to cover such an output level. As mentioned earlier, the ratio of Q* divided by Q_{MES} is used by Gal to give an indication of market size. A value of one for this ratio indicates that the market is just large enough to support a single firm operating at minimum efficient scale. A value of two indicates that two firms of minimum efficient scale can be supported while values of less than one, as here, indicate that not even a single firm of minimum efficient scale can be supported.

Obviously, the important implication here is that costs in small economies are higher than in larger economies if the businesses cannot operate at the minimum efficient scale. The previously mentioned tension then is the trade-off from achieving larger operation sizes (which lowers cost here from AC(Q*) to AC(Q_{MES}) in Figure 2) versus the potential increase in market price that may arise from a more concentrated market (prices increasing from P_0 to P_1 in Figure 1 due to a firm with market power restricting the output it supplies to the market).

Figure 2: Higher unit costs resulting from the non-optimal scale of production



For a given level of capacity, another type of productive inefficiency that can occur arises from poor management incentives and has been termed X-efficiency by Leibenstein (1966). In a competitive corporate environment, governance structures or the threat of takeover provide the pressure for management to operate the firm in the most productively efficient manner. Where there are weaker governance arrangements or protection from the loss of control, this pressure may be weakened and result in slacker management and productive inefficiencies. As already mentioned, in small economies this process may arise from government protection of national champions or personal ties between managers and regulators/law makers.

4.3. Dynamic Efficiency

Dynamic efficiency has a longer-term perspective on efficiency and refers to the welfare gains that can be achieved through appropriate research and development (R&D) expenditures designed to create new products and processes. If firms in small economies have very low levels of R&D, this can result in significant cost disadvantages as compared to firms in larger economies.

There are conflicting a priori arguments as to the effect of firm size on R&D activity. On the one hand, some researchers have argued that a large firm size facilitates innovation by providing the allure of large monopoly rents as a reward for innovative activity. The possession of some monopoly power enables an innovator to reap profits from the investment and thereby provides the incentives to undertake it in the first place. Also, on an ongoing basis, the profits provide an internal source of funding for further research and development. On the other hand, it has also been argued that large size can inhibit innovation due to the greater bureaucracy and administrative burdens that research divisions in large firms have to work under. In general, studies has concluded that that R&D increases more than proportionally with scale up to a certain size and then decreases as a proportion of sales. However, the minimum firm size required can still be quite large as compared to the market (Gal, 2001).

Research has also found that a more concentrated market structure results in less R&D activity. The ability of firms in more concentrated markets to achieve and retain greater profit levels (through market power and barriers to entry) may be thought to increase the incentive to innovate. However, it seems that the lack of fear from outside entry lowers the incentive or necessity to innovate as it is always a risky process and could disrupt the profitable status quo. Instead, such firms endeavour to extend the life of existing assets by slowing the rate of adoption of new technology.

Other areas which research has found to improve the degree of R&D include high foreign ownership, high product diversity within firms, and government grants. The important conclusion for small economies therefore is that they may be caught again in the tension between the necessity of requiring large firms in order to have successful R&D programs and the fact that large firms imply the existence of concentrated industries which can have potential deleterious effects on market power.

In light of this tension between firm size, market structure and innovative activity, some recent writers have argued that oligopoly – an intermediate between monopoly and many-firm competition – is the best market structure for optimising innovative activity. The eminent economist William J Baumol has taken this position recently in his book *The Free Market Innovation Machine: Analysing the Growth Miracle of Capitalism* (2004)*:*

> The heart of the story is the key role of oligopolistic competition in the process of free market growth…one of the primary reasons for any other economic arrangement even to approximate the capitalistic growth record for any considerable period is the absence of oligopolistic rivalry in those other economies. I need only add a word of explanation for the emphasis on oligopoly, with its small number of large competing firms, rather than any other market form. The answer, whether or not fully convincing, is straightforward. Monopoly will not do because by definition, it is immune, or largely immune, from competition and that can materially weaken its incentives to invest in innovation. At the other extreme the small firms that inhabit the world of imperfect competition …tend to lack the resources (to innovate)…Almost by definition, it is only in oligopoly, where a few large (often giant) firms dominate a particular market, that competitive races amongst established firms can occur, and only in oligopoly that rivals observe and keep track of one another's behaviour. Thus almost all of the innovative rivalry...occurs in the economy's oligopoly industries. So, paradoxically, it is an economy's oligopolies, which are often particularly suspect as a threat to public interest, that may well prove to be the main industrial contributors to growth and standards of living.

4.4. Small Economy Efficiency Effects

The size of firms in a market yields complex influences on market efficiency performance in a small economy. Figure 3 (overleaf) presents a schematic of the efficiency effects of the characteristics of small economies discussed in Section 3. The most significant relationship arises from scale economies where larger sized firms result in greater productive efficiency in many industries. Larger sized firms may also induce greater dynamic efficiencies through increased R&D. This benefit, however, can be offset by the consequent higher market concentration levels which contain with it the danger of market power and allocative inefficiency. Other influences on efficiency summarized in Figure 3 include:

- A small political and business elite can potentially result in government protection, collusion and other anti-competitive behaviour. This may result in greater concentration and/or directly increase market power.

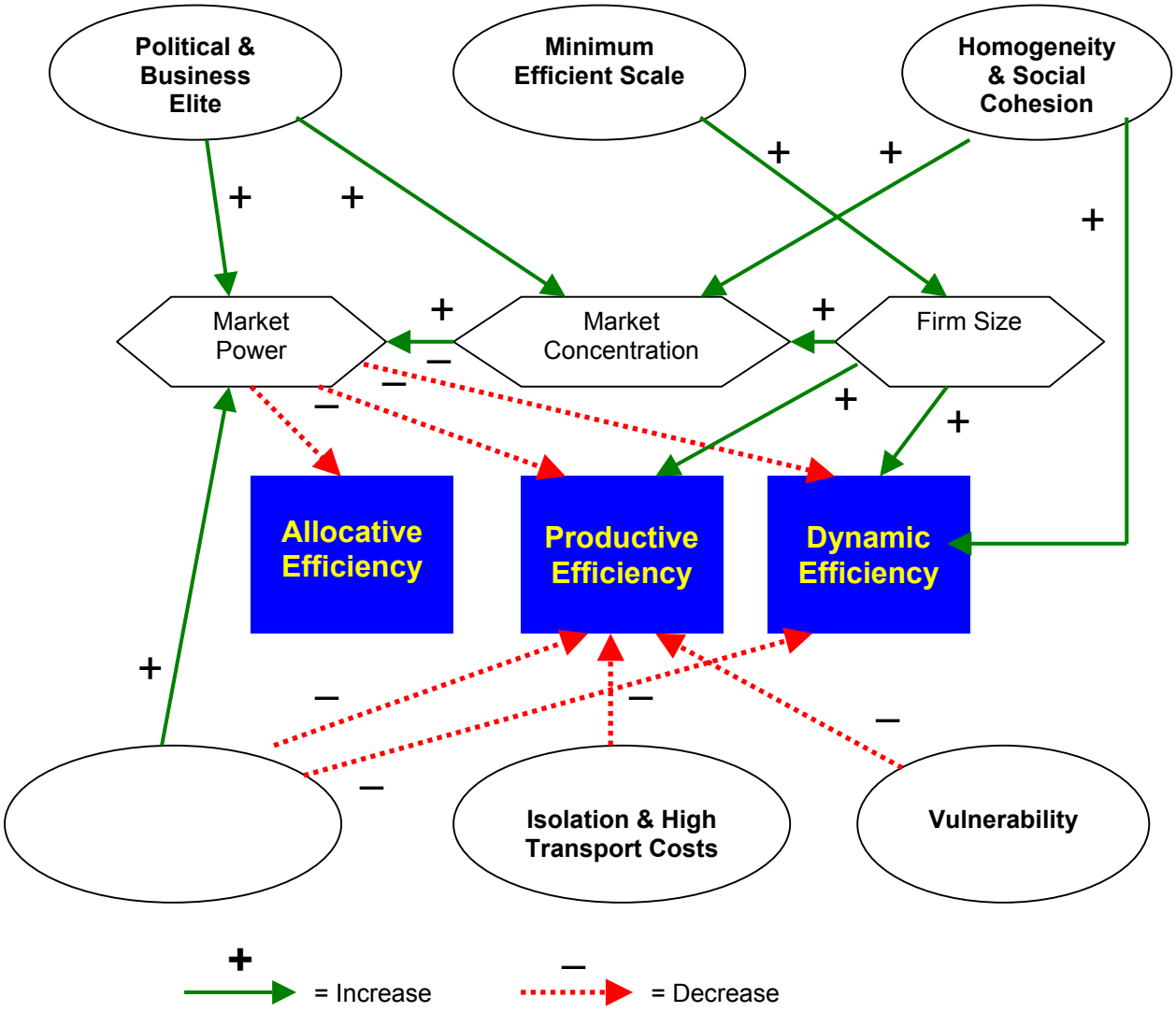
- Homogeneity in society can reduce market opportunities and lead to greater market concentration. Social cohesion and adaptability can lead to greater dynamic efficiency as innovations can be more rapidly diffused through the market.

- Limited natural and human resources can directly lead to increased production costs and reduce dynamic efficiency. There is also the potential for the monopolization of natural resources leading to market power. A smaller human resource pool probably reduces the potential for innovation and reduces dynamic efficiency.

- Isolation, high transportation costs, and vulnerability all raise production costs including the costs of capital.

Whilst some of these dilemmas may be found in large economies, small market size sharpens the focus as the efficiency consequences are likely to have a much more significant impact.

Figure 3: Efficiency implications of characteristics of small economies



5. Implications for Regulation and Competition Policy

In this section we draw on the previous analysis to set out implications for regulation and competition policy in small economies. Each section begins with a general comment on the relevant implications which is then illustrated with examples from various small economies. Empirical evidence comes from a number of studies conducted by academics and international associations, e.g. the OECD and the ITU. For the most part, the evidence comes from Caribbean countries which have been researched rather more than elsewhere. We have built on this evidence through interviews with regulatory managers in telecommunications companies in small economies[7], not just in the Caribbean.

5.1. The Goals of Regulation and Competition Policy

General Comments

The goals of regulation and economic policy should always be clear, regardless of the size of the economy. Clear objectives signal to market participants, as well as to the relevant authorities, how the law should be interpreted and implemented and provide regulatory certainty. The special characteristics of small economies increase this need for clarity as striking a balance between competing goals raises particularly difficult trade-offs.

We have seen from the discussion above how the small size of an economy increases the need for a clear trade-off between different types of efficiency. To achieve this trade-off Gal (2004) recommends that competition policy in small economies should "strive to serve only one master, economic efficiency, because they are less able than their larger counterparts to afford a competition policy that sacrifices economic efficiency for broader objectives". Broader objectives includes social objectives, such as ensuring universal availability of particular telecommunications services. Whilst such wider social objectives of course have a place, in small these should be pursued through other instruments than competition and regulation policy.

Whereas, large economies can afford to makes concessions to social goals since "the few islands of market imperfections in a largely competitive sea are not likely to have much adverse incremental impact on the distribution of income and the maintenance of small, dispersed firms" (Gal 2004). In small economies, efficiency imperatives require the creation of large firms, relative to domestic market size, which may displace small firms. Of course, creating economic efficiency should not be at the expense of consumer protection.

We have also seen how a small population size may lead to a small, tightly knit, political and social elite which may jeopardise the independence of the regulatory authorities. Clear goals can help to reinforce the independence required to ensure efficient regulation rather than regulation which is overly influenced by political lobbying.

Empirical Evidence

Below are the objectives of utility and telecommunications sector specific regulators in three small economies in different parts of the world: Jamaica, Guernsey and the Maldives.

The Objectives of the Office of Utilities Regulation (OUR) in Jamaica are:

- To establish and maintain transparent, consistent and objective rules for the regulation of utility service providers.
- To promote the long term, efficient provision of utility services for national development consistent with government's policy.
- To provide an avenue of appeal for consumers in their relationship with the utility service providers.

[7] An e-mail questionnaire was sent to regulatory managers in telecommunications companies in Barbados, Cayman Islands, Guernsey, Jamaica, Macao, Maldives and St. Lucia.

- To work with other related agencies in the promotion of a sustainable environment. To act independently and impartially.

The strategic aims of the Office of Utility Regulation in Guernsey (OUR) are:

- To ensure that consumers receive the best value, choice and access to high quality utility services.
- To ensure that the Bailiwick of Guernsey has vibrant, sustainable utility sectors capable of maintaining pace with global developments and thereby contributing to the economic and social well-being of the islands.

The Telecoms Authority of the Maldives (TAM) presents its objectives as:

- Reduce charges of all telecommunications services;
- Expand telecommunications services and reduce the disparity between Male and the other islands;
- Provide powers to the regulator through an appropriate legislative framework;
- Open the telecommunications sector and encourage competition;
- Make government revenue from the sector less dependent on the profit of the sector;
- Facilitate the use of information and communications technology in all areas of development.

Only the OUR in Jamaica explicitly mentions efficiency. The TAM arguably has the least appropriate set of objectives with a strong consumer bias and a tax raising objective. Its objectives do not mention efficiency at all but rather concentrate on consumer and social objectives. As we have already stated, such aims are legitimate but should be pursued through other policy instruments.

5.2. Concentration and Efficiency

General Comments

We have discussed above the core characteristic of small economies as being the presence of small numbers of firms in many industries and the fact that these firms are often of sub-optimal size. As we discussed in Section 4, the trade-off between different forms of efficiency caused by the presence of sub-optimally sized firms is central to small economies. It is of such importance that Gal describes it as the “basic conflict created by smallness”. In a static situation, this may entail a conflict between the achievement of allocative and productive efficiencies. In a dynamic situation, there may be a conflict between the achievement of static, particularly productive, efficiencies and the attainment of dynamic efficiencies.

The OECD points out that competition authorities and sector regulators in small economies, therefore, are confronted by a conundrum. An overly aggressive approach to their role, i.e. forcing the market to open to competition or preventing horizontal mergers, may prevent efficiency enhancing outcomes from taking place in that firms may not be able to achieve minimum economic scale (MES). On the other hand, an overly permissive approach, allowing monopolies to remain or develop, may lead to the entrenchment of market power (OECD 2003c).

In our discussion on efficiency, we saw how in a small economy trade-offs have to be made between the dynamic efficiency gains which might come from competitive rivalry driving innovation and productive efficiency gains from firms achieving economies of scale. The latter may require markets to be more concentrated in a small economy than would be acceptable or desirable in a larger economy. If we refer back to the Hoffman-LaRoche case discussed in the introduction, it is not a dominant position per se which causes economic problems, but the abuse of dominance.

Small economies should not, therefore, pursue a policy which views high seller concentration as undesirable *per se* (Gal 2001, 2004). Rather, competition policy should be sympathetic to the enhancement of output by individual firms, through either internal growth or mergers, which allows for the realisation of economies of scale which were not realised by previous market structures, and

could not be realised in less anti-competitive ways. For instance, mergers of sub-optimally size firms or facilities in the same market, whether national or regional, may promote the consolidation of capacity and the eventual achievement of economies of scale.

Similarly, in industries where firms are licensed, such as telecommunications, regulators should not be overly concerned if few firms apply for licences when first issued or if some firms which apply for licences do not launch a commercial service. It may be that firms are taking the rational step of achieving scale before the service is launched.

Empirical Analysis

Surveying the approach taken by telecommunications regulators in small economies illustrates the different responses countries have taken. Some have issued many licences and allowed market forces to establish the equilibrium number of firms that survive but by so doing have run the risk of attracting inefficient investment. Others have sought to "design" the market by issuing what the regulator believes to be the optimum number of licences. Similarly, some commentators have suggested that small economies are not suited to competition and that at least some sectors should be treated as "natural monopolies".

The International Telecommunications Union (ITU) is clearly of the view that competition can be made to work in even the smallest countries. In a case study of St Lucia it credits the doubling of mobile penetration to 83% in a six month period to the issuing to two additional mobile licences. It also claims that liberalisation resulted in large investments, an increase in employment and network upgrades to support advanced mobile internet features. It concludes:

> *That competition can be made to work in such a relatively small market is a stunning rebuttal to the historical argument that small island developing states (SIDS) are not suited to competition. This is a lesson for other SIDS* (ITU 2004).

St Lucia also demonstrates that the introduction of competition can lead to very aggressive, and potentially non-sustainable, price cuts. The launch of the Digicel as a competitor to the incumbent, Cable & Wireless (C&W), resulted in 1,000 new mobile phones sold in just four days[8]. Digicel offered an EC$50 discount if purchasers dumped their C&W phone in a special bin provided for the purpose. C&W attempted to pre-empt the introduction of competition by flooding the market, launching billing by the second and a 50% reduction in rates in less than two years (Stewart, 2003).

By contrast, the Bahamas' telecommunications regulator (the Public Utilities Commission – PUC) has taken the view that the market can only support a small number of suppliers and that therefore it must limit market entry (Stewart, 2003). When the Internet services market was liberalised 11 companies applied for and were granted licences, but only three are operational. Similarly, in Barbados, the government made a conscious decision not to issue more than six licences for international services. We understand that this decision was made as a result of the Jamaican experience where over 50 such licences were issued driving down tariffs to an unsustainable level.

Like many islands in the Caribbean, the telecommunications market in Jamaica has, until recently, been a monopoly. In 2000, the government passed the Telecommunications Act 2000 which introduced a structured transition to liberalisation in three phases over three years. This resulted in a large number of new entrants. However, few of the entrants have been able to establish a sustainable market presence. According to the Jamaica Competitive Telecommunications Association (JCTA), of 72 Internet Service Providers (ISPs) granted licences, only seven are operational and 14 of the 17 companies granted international voice licences in March 2003 are out of business (JCTA 2005a).

In the mobile market, there are three licensees: Cable & Wireless Jamaica (CWJ), Digicel and Oceanic. Table 3 shows the proportion of residential and business customers using each of the three networks. Some years ago, the market shares of Digicel and C&WJ were approximately equal at

[8] 0.6% of the population. St Lucia has a population of 160,000.

about 50% each, so we have seen a drift over the past few years to a more concentrated market with one company having a 70% - 75% market share.

Table 3: Jamaica Mobile Market Shares

Network	Residential Customers	Business Customers
Digicel	75%	70%
CWJ	23%	30%
Oceanic (Centinniel)	2%	0%

(Source: OUR 2004a)

The drift towards concentration raises three interesting questions for this study: first what is its cause?; secondly how, if at all should the regulator respond to increasing concentration?; and thirdly did the opening up of the market to three mobile licensees result in inefficient investments? These are particularly pertinent questions at the time of writing as the Office of Utility Regulation (OUR) had recently announced the re-issuing of a fourth licence.

The cause of concentration is, unsurprisingly, the subject of disagreement between players in the Jamaican market. JCTA places the blame squarely on policy makers and weak regulation of the incumbent. In a letter to the Prime Minister dated July 21st 2005, JCTA set out three reasons why so few competitors are operational today:

i) lack of regulatory oversight and proactive stance in managing the dominant carriers;
ii) lack of legal standing of the Fair Trade Commission (FTC) to take appropriate action against anti-competitive behaviour; and
iii) lack of Ministerial intervention to force agencies to do their duties.

The effect of this lack of official activity is, according to JCTA, that "innovative services have been stifled, Jamaican consumers pay much higher prices for services than other countries (and) local business people have seen their investments disappear" (JCTA 2005b).

There is, however, an alternative explanation for the lower than expected levels of competition. According to the OUR, the industry had reached a point of stability at the beginning of 2005 and that the level at which international settlement rate stabilised had discouraged smaller operators. This opinion is partly shared by one new entrant, Knutsford Telecom. The company claims that too many licences were issued chasing a limited number of minutes, and therefore revenue. A similar view is shared by Jamaica Network Access Point (JNAP). This company believes that market forces have prevailed and that firms that rely on call termination without developing their own infrastructure are in a weak position (Jamaica Observer, 2005). Some supporting evidence of JNAP's perspective is provided by the OUR itself. Table 4 shows US outbound traffic to Jamaica. Over the period 2000 – 2002, revenue per line for fell by 64% and the rate per minute fell by 28%.

The falls in price and revenue per line were not only due to increased competition in Jamaica but also to the change in accounting rates imposed by the USA leading to lower termination rates.

Table 4: US Outbound Traffic to Jamaica

Year	Number of lines in Jamaica	Outgoing Traffic million minutes	Customer Revenue US$ Mn.	Average rate per minute US$	Average Minutes per line	Per line Revenue US$
2000	743,365	289.3	166.8	0.58	389.18	225.68
2001	1,146,544	373.2	138.7	0.37	325.41	120.9
2002	1,696,521	524.0	168	0.42	255.61	81.95

(Source: OUR 2004b)

So endogenous market factors and exogenous changes imposed by other regulators appear to have had a detrimental effect on the size of the Jamaican market, already small by international standards, reducing the scope of the sustainable entry.

We now turn to the second question arising from the increased concentration: how should the regulator respond to increasing concentration? The theoretical analysis above suggests that the regulator should not immediately feel any need to respond. In a small economy it may be necessary for firms to merge and markets to concentrate more than in a larger economy so as to gain productive efficiencies. If the regulator tries to keep "too many" players in the market, none may be able to achieve MES and costs of production may be forced up. But these productive efficiency gains must be off-set against allocative efficiency losses if the market power of large firms results in prices being set above cost.

The third question is whether the regulator was wrong to open up the market to so much competition in the first place or should it have attempted to design an efficient market structure ex ante.

Again, there are (at least) two points of view. In favour of allowing extensive market entry is the argument that firms considering entering the market will first make a decision whether to enter or not based on the expected levels of competition and profit. The greater the level of competition expected prior to entry, the lower the anticipated returns and so the lower the incentives to entry. This argument applies equally to incumbents who must decide whether to introduce a new product taking account of the loss of sales for existing products (Shaked and Sutton 1990).

Thus some ISPs considering entering the Jamaican market may have seen that 72 licences were issued and come to the conclusion that the level of profit available would be too low to justify entry and that better returns on their investment could come from other markets. If this were the case, and we have no evidence to support or refute it, then firms would be acting quite rationally.

Once firms have decided to enter the market, normal market forces apply, i.e. the firm has to operate efficiently so that it can offer a competitive product at a competitive price, whilst earning at least normal profits, or it will be forced to exit the market. Again if there is an unsustainable number of firms actually in the market, profits will be too low and some firms will exit.

So, by issuing many licences the regulator is allowing firms to make their own rational decision about entry and exit. This suggests that when determining the extent of any market concentration, one should not start with the number of licences issued, but with the number of firms which went to the next stage of market entry.

The alternative argument is that by encouraging excessive entry, the regulator is encouraging inefficient investment which will have a negative economic effect. Much investment in telecommunications is regarded as sunk cost which cannot be recovered in the event that a firm exits the market. Where firms are exiting the market due to excessive initial entry, there is unlikely to be a local second hand market for telecoms-specific assets as there are unlikely to be new entrants looking for low cost equipment. Two firms which entered the Jamaican market, and subsequently exited, estimated their combined losses to be J$22 million (US$368,000).

Of more financial significance is likely to be the costs incurred by Oceanic (with just 2% of the mobile market) and Gotel which has so far only won one percent of the domestic fixed line market[9]. The sunk costs of these networks is likely to be higher than those of ISPs or service based competitors and so would represent a greater loss to the economy if these firms exited the market.

A small economy is proportionately less able to absorb the sunk costs of firms that fail than a large economy as they represent a proportionately larger share of the economy. It is therefore arguable that a regulator which allows market forces to determine the equilibrium market structure, regardless of the sunk costs lost to the economy, encourages inefficient investment which a small economy can ill afford.

In conclusion, we can say that policy makers in a small economy should not be overly concerned if markets are more concentrated that in a large economy, including if a newly liberalised market, with significant entry, consolidates. This phenomenon is likely to be the result of natural market forces. Secondly, whilst it may be attractive to issue many licences in the hope of generating intense

[9] Both Oceanic and Gotel have limited geographic coverage which may affect their market share. However, it is questionable that even niche players can survive in a market of 2.6 million people with such a small share.

competition, it may be better to issue fewer licences so that when consolidation occurs, investment in redundant assets is not wasted. Behavioural remedies can be imposed on firms to ensure that they do not exploit market power to the detriment of consumers.

5.3. Staffing of Regulators, Cross Border Regulation and Self-Policing Policies

General Comments

Sector regulators and competition authorities in small economies face at least as complex a set of problems as their counterparts in large economies. They need the capacity to be able to weigh up competition issues and their effects on efficiency. The analysis of these issues will be complex and require analytical sophistication and significant data sets. (OECD, 2003c). Authorities therefore need adequate numbers of staff with the right training and experience.

An accepted benchmark is that telecommunications regulatory agencies generally need thirty or more professional engineering, accounting, pricing, legal, and administrative professional staff. (Smith and Wellenius 1999 p.4). Domah, Politt and Stern (2002) made a comparison between developing and developed countries and concluded that a typical developing country regulator needs between 30 and 34 staff members to regulate the electricity sector alone.

Controlling monopolies and anti-competitive conduct, like most other kinds of public administration, is subject to economies of scale in that the costs of administration per head of population decrease as the size of the economy increases. However, the number of monopolies, mergers and cartels which require the attention of the competition authorities in a small economy is not necessarily smaller than in a large economy: although there are fewer firms, a larger proportion of industries are prone to domination by monopolies or oligopolies. Thus, the control of monopolies and anti-competitive practices may well be a proportionately *more* expensive task in small than large economies, but without the number of people required for the task. A small economy is consequently under particular pressure to economise on the control of monopolies and restrictive practices.

One way is to make use of the analysis and techniques developed in larger economies, adapting these to the extent possible to the conditions faced by small economies. As we have seen, however, there are always dangers in this approach. Although economic principles are the same regardless of economy size, the policies and priorities may differ.

A second means is to seek to concentrate all regulatory functions concerned with the promotion of competition into a single agency to achieve both cost savings and analytical synergies. This trend is already evident is several economies. In New Zealand, for example, the Commerce Commission is responsible for enforcing legislation on general competition, consumer protection, telecommunications, electricity and competition in the dairy sector. (OECD 2003c).

A third means, particularly in areas where there are groups of small economies, is to set up cross-border regulatory and competition authorities and thus share the costs needed to implement policies. Finally, another means to economise on resources is by adopting laws that create strong incentives for market participants to act in conformity with the objectives of the law. The costs of implementing competition policy can be reduced without reducing the standard of implementation.

Empirical Analysis

The survey conducted for this report confirms the stylised fact regarding the small human resource pool. All of the countries, except one, reported that their regulator had insufficient numbers of experienced and qualified staff to undertake their tasks. The one exception reported that their regulator had just enough staff to do the job but with no “slack”. The lack of resource is not related to a lack of calibre amongst individual staff in small economies, just a straight forward lack of quantity of suitably qualified and experienced staff.

The lack of resource tends to impact the industry in two ways. First, some issues are either ignored as there is no resource to deal with the matter or resolution is delayed which, respondents reported, can lead to delays in approving new services. Secondly, some regulators try to overcome their own

lack of resource by benchmarking against other regimes and imposing best practice. For example, one country reported that its regulator tends to benchmark against New Zealand, the UK, Ireland and the EU as a whole and then imposes best practice. This approach however leads to a disproportionate regulatory burden on the country as the imposed regulation takes no account of the size and resources of the economy.

Some quotes from the survey regarding the lack of resources are shown below:

- "*The (regulator) is under-resourced and is therefore unable to manage persons offering services without licences, bypass and use of spectrum without permission."*
- *"The challenge faced by the (regulator) is that the staff is very inexperienced and therefore do not have any experiences to draw on when dealing with regulatory issues."*
- *The (regulator) only has 2-3 staff members whose only experience (if any) would be previous work at (the incumbent).*
- *There is a lack of legal and economic skills.*

The respondents reported that the lack of suitably qualified and experienced staff did not just apply to the regulator but also to themselves and to other companies operating in the market.

The survey also confirmed the presence of a small socio-economic elite with only one respondent saying that this did not cause any particular problems. Some of the issues raised by respondents in other countries are shown below.

- *There is a small number of families that control most of the wealth in the island. This will be advantageous if we have a good relationship with those families. If you do not, you are shut out of any opportunities associated with that family. Additionally, and perhaps more importantly, politics are also controlled by an elite and if (the company) is not in favour with those politicians, (the company) will get a rough ride. This happened to a great extent at the commencement of liberalisation where the politicians did not hesitate to bad-mouth (the company).*
- *The former head of the central planning authority, known to be anti-(the company), was able to delay a number of our mobile tower projects and to favour towers erected by competitors.*
- *Due to the size of the government, and the small number of people involved, the number of stakeholders in telecommunications is relatively high and this tends to influence the way we approach government relations.*

Where there is a small population it is inevitable that there will be fewer qualified and experienced people to recruit from than in a large population and that the elite will have proportionately more influence. The question we are interested in is what, if anything, can be done to mitigate the problems that it causes and whether there are any examples of such action?

The problems described above are generally referred to as a lack of "regulatory capacity". Stirton and Lodge (2002), in the context of a study on regulation in Jamaica, set out three dimensions of regulatory capacity: ability to manage technical complexity; presence of check and balances against capture and administrative expropriation; and embeddedness of regulatory institutions. These three dimensions are not entirely independent. As we shall see, adequate technical resource, for example, is one way to prevent regulatory capture. The framework described by Stirton and Lodge forms an interesting basis on which to assess how the small economies we have surveyed have addressed the problems caused by the lack of human resources.

In the sub-sections below, we describe each dimension of regulatory embeddedness and then examine how some countries have addressed the issue.

Ability to Manage Technical Complexity

The ability to manage technical complexity refers simply to the supply of appropriate professional personnel and the professional development of the staff that are available.

The obvious way in which small economies try to address this problem is to look to "import" regulatory policy from larger economies. The countries we surveyed all reported that the government looked to larger neighbours for models of regulation. But, as we have discussed at length above, regulatory policy which is suitable to a large country is not necessarily suitable to small countries.

St Lucia, and the other Eastern Caribbean islands[10], have sought to address this issue by forming the Eastern Caribbean Telecommunications Authority (ECTEL) which is responsible for giving recommendations to the National Telecommunications Regulatory Commissions (NTRC) and governments in each of the islands.

ECTEL's mission is *"To create a fully liberalised telecommunications environment, by promoting competition amongst service providers for the delivery of efficient and affordable telecommunications services to the people of ECTEL Member States, by implementing applicable laws, treaties and agreements through fair, transparent and independent processes."* Note the inclusion of the word "efficient" in this objective.

Its area of competence covers regional policy, types of telecoms services, licensing, fees, pricing and management of the Universal Service Fund. ECTEL was established under the ECTEL Treaty which was signed on May 4th 2000. ECTEL is still relatively small, about 20 people, but it is able to provide support to the even smaller regulators in the individual islands.

ECTEL has issued a number of consultations on specific areas of policy including: International Simple Resale, Licensing and Authorisations, and Spectrum Management. By issuing consultations collectively through ECTEL each island regulator has no need to go through the process separately.

By forming ECTEL, the eastern Caribbean states have been able to benefit from critical mass which they would not be able to do individually.

Another Caribbean island that has used external support on specific issues where the regulator did not have sufficient expertise was Jamaica. At the beginning of the de-regulatory process, the Office of Utility Regulation (OUR) faced the challenge of tariff re-balancing and developing a price cap but did not have the expertise to address these issues. The government asked the UK's Department for International Development (DfID) for technical assistance. A regulatory economist was seconded from the then UK telecommunications regulator, Oftel, for eighteen months to work with the OUR technical staff and to pass his knowledge on to them. Support was also provided by the equivalent government department in Canada, CIDA (Stirton and Lodge 2002).

These two examples show how different small economies have been able to, at least partially, address the lack of technical expertise but without simply importing regulatory approaches from other, larger, countries which might have inappropriate regulation for their special national circumstances.

Presence of Checks and Balances

Regulatory institutions may be vulnerable to two contrasting pitfalls: first "capture" in the sense that they come to identify their own interests with those of the industry and secondly the temptation to expropriate industry profit by setting prices too low (Stirton and Lodge 2002). They may also be subject to political interference. These dangers may be particularly strong in small economies where there is a small political and social elite putting pressure on the regulator.

To provide checks and balances, it is necessary for the regulatory institution to have a clear set of objectives, legal independence from the government and the powers to execute its task. It also needs adequate technical resources so that it can decide policy without being dependent on information provided by the dominant operator.

All the regulators in the survey had their powers set by law, though in two cases the powers were broadly defined and somewhat vague.

[10] St Vincent and the Grenadines, St Kitts, Grenada and Dominica.

In our survey we found a mixed response to the question of legal independence. At one extreme the regulatory authority has no independence, indeed it is part of a government department. At the other extreme the law guarantees independence and this independence is respected by the government. The other countries were somewhere between these extremes. Independence was either granted de facto, i.e. there was no specific statement of independence, or the Ministry retained policy setting power but had no operational input.

Despite the variety of degrees of de jure political independence, the survey found little evidence of political interference beyond what was allowed by law. In two cases it was felt that the regulator would not act in a way contrary to the political direction of the government, though this was due to the regulator being “aligned” with the government rather than any overt and direct interference.

Regulatory Embeddedness

Stirton and Lodge describe regulatory embeddedness as the extent to which the regulatory authorities are part of the overall society. According to their analysis, regulatory agencies are likely to be most embedded when there are:

- Multiple competing operators within one sector;
- Adequate mechanisms for providing information and choice to consumers;
- Cross-sectoral regulatory agencies exercising authority over a number of sectors.

And when:

- The regulatory approach is shared between overlapping agencies/departments;
- Legitimacy is based on normative rules, i.e. rules that set out “what ought to be”; and
- National and intergovernmental regulatory policy is supported by agreements between states.

Competition embeds the regulatory process as competitors provide a counter to the superior resources of the incumbent. Informed consumers behave in a similar manner.

Looking across the small economies in the survey, the dimension of regulatory embeddedness on which they are weakest is the lack of a cross-sectoral agency exercising authority over a number of sectors. In particular, most of the countries in the survey, with the exception of Barbados, do not have a separate competition authority addressing general competition concerns in all sectors, including telecommunications.

In Barbados, the Fair Trade Commission (FTC) has three objectives: safeguarding the interests of consumers; promoting competitive markets; and promoting and encouraging fair competition. It was established in 2001 under the Fair Trade Commission Act and is responsible for the enforcement of the provisions of the Utilities Regulation Act, the Telecommunications Act, the Fair Competition Act and the Consumer Protection Act. It is therefore responsible for general competition regulation as well as specific regulation of utilities in general and telecommunications in particular. By acting also a consumer protection body, the FTC embeds regulation by proving advice and information to consumers in addition to cross-sector role.

Respondents in the other countries surveyed reported a generally low awareness of competition law principles and a degree of reluctance on behalf of the private sector to have a competition law which might weaken existing monopoly and duopoly market structures, regardless of the sector.

5.4. Competition and Merger Law

General Comments

European and US merger law has a number of "rules of thumb" by which a proposed merger may be judged by the competition authorities. For example, if concentration raises above a given threshold, the proposed merger may be referred to the competition authorities for an investigation. Usually, European and US competition authorities are not required to investigate efficiency, though an

efficiency defence may be used in some jurisdictions. In the United Kingdom, for example, the Office of Fair Trading (OFT) undertakes the initial investigation of whether a proposed or completed merger is likely to cause a "substantial lessening or competition". The OFT is required to refer any mergers that raise such concerns to the Competition Commission for further, more detailed investigation but can exercise its discretion not to refer if it believes that there are sufficient efficiency benefits to the merger that outweigh any detrimental effects on competition. Any such efficiency benefits need to be demonstrable and quantifiable to be taken into account by the OFT[11].

Our analysis so far leads us to conclude that such an approach may also be appropriate for small economies. Competition may be substantially lessened by a merger, but this should not necessarily prevent it if there are significant efficiency gains. Instead small economies' competition law should focus on efficiency evaluations of mergers and trade practices rather than rules of thumb that imply the elimination of some potentially efficiency enhancing activities. This implies that the *behaviour* of firms in these industries should be the criterion for the application of competition law, rather than traditional measures of *market structure* (Evans et. al., 2003). So again, we see that especially in small economies, it is not the presence of dominance that is critical, but the existence or otherwise of abuse of dominance.

However, efficiency improvements resulting from the size of a firm post merger or as a result of organic growth can be very difficult to judge and private sector companies always have an incentive to overstate the efficiency benefits that are likely to accrue. In particular, projected gains to dynamic efficiency resulting from the adoption of improved technology can be notoriously difficult to measure ex ante.

This situation has several implications for competition law in small economies. First, greater scope is needed than in larger economies to ensure that efficiency considerations are fully considered. This applies to consideration of both mergers and of co-operative agreements amongst rivals as both may be means for firms to achieve significant productive efficiencies. In the first instance, it may be useful for the law to allow competition authorities to assess efficiency considerations at the point of considering whether various transactions have the potential to breach competition thresholds (as occurs under New Zealand's merger clearance procedures). Once a problem with competition thresholds has been identified, it is just as important to allow firms the opportunity to put a case to show that gains from improved efficiency will outweigh losses from a lessening of competition. This may be achieved through inclusion in the law of an explicit efficiency defence in legislation (as occurs in Canada) or through an authorisation procedure based on "public benefit" (as occurs in Australia and New Zealand). Berry and Pickford, citing the number of cases in which New Zealand mergers have been authorised on public benefit grounds, argue that New Zealand's competition authorities have developed a more tolerant approach to mergers claiming efficiencies than is the case in the United States or Canada (OECD 2003c).

The challenge for competition authorities is to ensure that while efficiency improvements may theoretically result from increased concentration, the increased market power that results will not remove the incentive to carry out such improvements. In other words, they must consider the trade-off between productive efficiency gains that may come from scale against allocative efficiency losses which may arise from the increased market power of the merged entity. They must also consider whether the merged entity will have the same incentives to realise dynamic efficiency gains through investment and innovation of products and processes[12].

Authorities may also need to consider international competitiveness for firms that operate in a global market place and whose real competition is based in other economies. Bruglio (2004) has argued that it is often the case that a critical size is required to enable a firm to compete in the international market and so the argument for rationalisation, and against fragmentation, is a strong one.

[11] See Office of Fair Trading 2003
[12] For a variety of case studies in which efficiency was claimed as a benefit of a merger see Kwoka and White 2004.

Empirical Evidence

Competition law is generally less developed in small economies than in larger ones. In the six economies covered by our survey, only one (Barbados) has a separate competition authority, the Fair Trade Commission (FTC). The Barbadian Competition Act 2002-19 Section 20 (1) prohibits mergers if one of the companies already has, or if the post merger entity will have, a market share in excess of 40% unless the merger is allowed by the FTC. In other words, the Competition Act places a threshold on any mergers before they may be allowed.

In the Maldives, the Telecommunications Regulations 2003 (article 44) prohibit mergers or acquisitions which have the effect of lessening competition, though there is no concentration threshold above which mergers are prohibited. Other economic sectors are not subject to any form of merger control.

The remaining four countries in the survey do not have merger regulations and the understanding of competition law was reported to be rudimentary.

It is likely that competition law will be increasingly adopted in many countries, including small economies as they enter the global trading system and are subject to international and regional pressures. The evidence of this report suggests that small economies should consider the specific issues they face when adopting competition law rather than simply importing laws designed for larger economies which face a quite different set of issues. The lack of a developed competition law may result in authorities making inappropriate decisions concerning market power forcing divestiture of large firms or preventing mergers when these may have a beneficial effect on the economy.

5.5. Technological Flexibility

Empirical Analysis

Earlier we identified a potential problem for small economies as being that the dynamic forces of variety and change being weaker than in large economies and that this might lead to a delayed introduction of new technologies. This problem may be exacerbated by government action to place tariffs on the import of the equipment needed to develop new systems and is further exacerbated by the shipping costs of that equipment, especially if the economy is an island.

Table 5 below seems to bear out the problem of later introduction of new technologies. The five large OECD economies introduced commercial DSL between 1997 and December 2000. The five small economies launched at least one year later.

Table 5 Commercial Launch Dates: DSL

Small Economies		Large Economies	
Economy	Launch date of commercial DSL	Economy	Launch date of commercial DSL
Barbados	2001	France	Nov 1999
Cayman Islands	2001	Germany	August 1999
Jamaica	2001	Japan	December 2000
Malta	March 2000	United Kingdom	July 2000
OECS	2001	USA	1997
Source: Cable & Wireless, Malta Times		*Source: OECD 2001*	

The problem can also be illustrated with comments from the survey:

- *Both shipping charges and duty increase our costs for equipment. Shipping entails either air or sea transport which can be expensive and time-consuming. Governments charge large duties, but also consumption taxes and sometimes telecom specific taxes.*

- *Customs duties and shipping costs no doubt play a role in investment decisions and business case approvals. Telecom operators have enjoyed a duty exemption on network equipment that recently expired and that will affect planning going forward.*
- *Lack of economies of scale would generally lead to us being avoided from volume discounts that larger countries would enjoy*.

Our interest is in appropriate policy response by governments which, we believe, is self evident: do not add to the costs of import and transport by unnecessary duties that raise the cost for telecommunications operators to develop their networks.

Telecommunications is known to be a driver of economic growth (see for example Datta and Agarwal 2004) so any unnecessary cost imposed on operators by governments is bound to slow down implementation of key technologies and therefore economic growth: a factor as important for high income countries as for developing economies.

Group purchasing power can also be valuable. In the Caribbean states Cable & Wireless and Digicel, as regional operators, are able to use their group purchasing power to off-set the small size of each island. Merger policy should therefore take into consideration the potential efficiency gains from regional acquisitions which allow companies to overcome the problem of size.

5.6. The Relative Importance of Structural Remedies and Conduct Regulation

Another implication is that small economies should be cautious in the application of structural remedies. Applied crudely, structural remedies may do little to enhance competition in small economies while they can act to significantly impede productive efficiencies.

Structural remedies to competition problems modify the allocation of property rights and create new firms. They include the complete or partial divestiture of an ongoing business. They contrast with behavioural, or non-structural remedies, which set constraints on the behaviour of firms and might include contractual arrangements, such as network access, licensing or access to intellectual property (Motta el al 2002).

As we have seen above, applying the structural remedy of opening up the market to many new licensees does not necessarily result in a highly competitive market if the market can only support a few firms. Indeed such over entry may itself be inefficient as firms exit the market and are unable to recover any of their initial investment.

Gal advises pursuit of behavioural policy through adoption of strict anti-collusion and anti-exclusionary conduct policy. While it is difficult to prohibit conscious parallelism since it is almost impossible for a market regulator to prescribe a different pattern of behaviour that can be enforced easily, strict anti-collusive policy should be applied to tacit collusions, to help break down oligopolistic coordination and induce oligopolists to operate at higher levels of output and lower prices than they would in the absence of legal consequences. Thus, illegal cartels, the creation and maintenance of artificial barriers to entry, and predatory pricing should be strictly prohibited.

6. A Regulatory Agenda for Telecommunications in Small Economies

We have seen from the analysis of small economies that they face a number of unique challenges which are not the case in large economies. It is therefore not always appropriate simply to import regulation and competition policy from large economies. In this final section we set out a seven point agenda for regulation and competition policy which takes the size of economy explicitly into account.

i. **Regulation and competition policy should start with the unique characteristics of the economy to be regulated rather than with the import of a model developed elsewhere.** The starting point for all regulatory activity should be the unique characteristics of the economy to be regulated. Whilst importing policy ideas from other countries may seem an attractive idea to utilise the lessons learnt elsewhere, the policies such countries have developed may not be suitable and may lead to inefficient, costly and unsuccessful remedies being imposed. It is better in the long run, even if it requires more work in the short term, to begin with an analysis of the problems at hand and an assessment of the remedies that might be appropriate.

ii. **Behavioural remedies on a small number of players may be more efficient than opening up the market too widely.** Small economies are less likely than larger economies to be able to support the large number of players required to make competition self-regulating and it is an inefficient use of limited resources to try to make it do so by opening up the market too widely. Structural remedies to competition problems may also be self defeating. Applied crudely, structural remedies may do little to enhance competition while they act significantly to impede productive efficiency.

   It is better therefore to limit market entry by licence to an efficient number of competitors but to ensure that these players cannot collude. The regulatory authorities should explicitly realise that there is a trade-off between productive, allocative and dynamic efficiency, caused by smallness, which no amount of market opening can resolve due to the presence of scale and scope economies. It may therefore need to sacrifice one form of efficiency to gain the others. Where the regulator does decide to issue licences widely, or to make entry free of legal restraints, then it should not be overly concerned if few companies enter the market or if there is a rapid process of consolidation as this may reflect natural market forces rather than anti-competitive behaviour by the incumbent.

iii. **Competition authorities and regulators should give at least equal weight to producer and consumer surplus when considering competition problems.** Most regulators and competition authorities are charged with protecting the interests of consumers. This objective can be met through emphasising consumer surplus gains when considering competition problems. In small economies, and especially when considering dynamic efficiency issues, regulators and competition authorities need also to bear in mind that firms too must enjoy a surplus to attract investment. Small economies are already at a disadvantage from the late introduction of new technologies. The problem should not be exacerbated by squeezing producer surplus such that firms have little or no incentive to invest.

iv. **Gain regulatory efficiency by teaming up with neighbours and/or similar economies.** Regulators, like companies, can benefit from economies of scale and scope. Trans-national organisations such as ECTEL can help to gain economies of scale by providing a centre of excellence which smaller national regulators can draw on to overcome the lack of people in a small economy. One regulator covering multiple utilities introduces economies of scope which can also be beneficial.

v. **Ensure a proper legal basis with checks and balances built into the system.** De jure and de facto independence of the regulatory body from both political interference and from the incumbent operator is one of the foundation stones of effective regulation. In a small economy it is often difficult to separate people as there is a small elite from which to chose

staff. Ensuring independence through separation of the regulator from the government will have a very beneficial effect.

vi. **Embed Regulation in the Institutions of the economy.** Whilst regulation may have to apply differently in small economies, the regulation that is required needs to be embedded by making the necessary institutions of regulation part of the infrastructure.

vii. **Use open trade policies to encourage investment.** Small economies are already at a disadvantage compared with larger economies when introducing new technologies. As these technologies often rely on imported equipment, it is self-defeating to impose heavy import duties which make the investment costs still higher than is necessary. It would be better for small economies to allow the import of essential equipment without duties so that they can bring forward the economic benefits that flow from an enhanced communications network.

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