



# Maximising ICT's contribution to the economic growth of Korea

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## Preface

In 2004 the European Union adopted the Lisbon Agenda target of becoming the world's most competitive and dynamic knowledge-based economy by 2010, with improved employment levels and social cohesion. In 2005 Ovum and Indepen published a report<sup>1</sup> on behalf of the Brussels Round Table<sup>2</sup> which argued that the Lisbon Agenda would only be achieved if Europe's productivity improved significantly, and that this in turn could only be achieved through greater and more effective use of ICT. After 50 years of catching up with productivity levels in the United States, European productivity growth suddenly started to decline relative to the US in 1995 and the gap has continued to widen over the past decade. We argued that this growing disparity was the result of radically different levels of investment in, and productive usage of, information and communications technology (ICT). We concluded that the achievement of the Lisbon Agenda, and the economic development of Europe as a whole, thus depended to a very large extent on effectively exploiting the benefits of ICT.

This report, also researched and published jointly by Ovum and Indepen, examines the same issues in the context of the Korean economy. Korea has been hugely successful in the ICT sector, most obviously in the manufacture and export of key hardware such as consumer electronics, mobile handsets and telecommunications network equipment. At the same time consumer uptake of new technologies such as broadband and 3G mobile communications has been faster and more extensive than in almost any other country. Korea has established itself in the premier league of world economies in terms of ICT production and usage. The success of the manufacturing and export industries has, however, tended to mask a rather more sluggish performance in the services sector, and particularly in the use of ICT as a means to boost service sector productivity.

Ovum and Indepen strongly urge policy-makers in Korea to address the issue of service sector productivity as a matter of urgency. Korea is coming under increasing pressure from China and other emerging nations in ICT manufacture and export. It will be increasingly difficult to deliver continued economic growth from these activities. Instead, policy measures must be put in place to enable the transition from an economy that is primarily manufacturing-based, to one that is primarily service-based, and to ensure that productivity in the services sector improves rapidly through the effective use of ICT. Such developments cannot occur whilst Korea persists in a command-and-control model of industrial policy. A market-led policy is essential. Business laws need to be simplified, flexibility needs to be provided in the labour market and in product markets, exports of services need to be supported at least as much as exports of equipment, and the regulatory environment needs to be given more transparency.

We commend this report as our contribution to the debate currently going on in Korea as to how the "economic miracle" of the past 50 years can be maintained well into the 21<sup>st</sup> Century. We do not claim to have all the answers. But in this report we present our best analysis of the market situation that Korea now finds itself in, and hope that it makes a worthwhile contribution to the future success of Korea.

Ovum has been active in Korea for more than ten years, and has had a thriving office in Seoul since 1998. We have been particularly active in the area of telecommunications regulation, but have also undertaken technical and commercial assignments for a wide range of industry players. This report forms part of our on-going investment in Korea and, I hope, emphasises our confidence in the future of both the ICT industry and the national economy.

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<sup>1</sup> *Achieving the Lisbon Agenda: the contribution of ICT*; Indepen and Ovum, January 2005.

<sup>2</sup> A think-tank whose members comprise Alcatel, BT, Deutsche Telekom, Ericsson, France Telecom, Philips, Siemens, Telefonica and Telecom Italia.



Chris Dines

Chief Executive Officer, Ovum plc

### **About Ovum**

Ovum is a leading authority on telecoms, software and IT services with unique expertise where these services converge. Ovum offers a range of services that includes tailored consultancy, advisory services that give direct access to our analysts and specialist research. Ovum has a practice dedicated to regulation and policy within the ICT sector. Ovum has offices in Europe, North America and Asia-Pacific, including Korea. More information can be found at [www.ovum.com](http://www.ovum.com).

### **About Indepen**

Indepen is an economic consultancy based in London with experience in government and in business, and with a particular focus on regulated industries. Indepen believes in developing economic policies that align the interests of all stakeholder groups, including government, industry, investors and consumers. We use our knowledge to challenge constructively and our thinking is independent, distinctive and rigorous. More information can be found at [www.indepen.co.uk](http://www.indepen.co.uk).

### **The partnership between Ovum and Indepen**

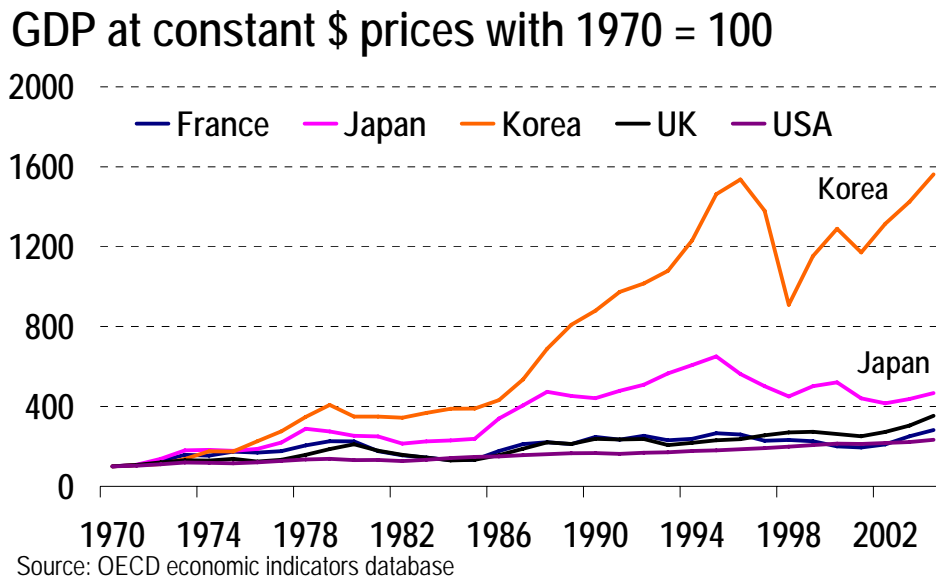
Ovum and Indepen have worked closely together on a wide variety of ICT policy and regulation assignments. Our initial co-operation was on a review in 2005 of the Lisbon Agenda of the European Union, and over the past twelve months we have undertaken leading-edge policy reviews for industry regulators including Ofcom in the UK, OFTA in Hong Kong and IDA in Singapore. Each of these assignments demonstrates the complementary skills of economic analysis and econometrics (Indepen) and market knowledge and the application of regulatory economics (Ovum).

## Executive Summary

### The Korean economy faces major challenges

Over the past 50 years Korea has transformed its economy. In the mid 1950s, at the end of the Korean War, the republic of South Korea was one of the poorest countries in the world. Since then its economy has grown strongly as Figure 1 illustrates. Between 1970 and 2004 for example Korea raised its GDP per head<sup>3</sup> from 15% to 55% of US GDP per head.

Figure 1



Today Korea has a GDP per head of \$14,000 per annum and its government has set itself the goal of increasing incomes to \$30,000 per annum as quickly as possible. How can the Korean government maximise the contribution which information and communication technologies (ICTs)<sup>4</sup> make to achieving this goal?

For the moment Korea's economy continues to grow strongly - fuelled by strong exports of which ICT manufactured goods constitute a major share. However to sustain strong growth Korea must now improve its use of ICT, particularly in the services sector. A more productive ICT sector would also contribute to export growth, both directly in terms of competitive ICT services exports and indirectly via the contribution efficient services can make to lowering exporters costs.

Productivity in Korea's services sector, which has grown from 40% to 60% of the economy during the past 25 years, is very low by OECD standards. Services sector productivity is normally lower than productivity in the more capital intensive manufacturing sector. But in the case of Korea the difference is startling. Whilst OECD service sector workers normally add 93% of the value of manufacturing workers the figure in Korea is only 56%. Eliminating this gap would boost Korea's

<sup>3</sup> When expressed at purchasing power parity (PPP) prices

<sup>4</sup> ICT includes both the use and production of computer hardware, software, telecoms and broadcasting equipment, together with telecoms, IT and broadcast services. It also includes the production of components of ICT equipment



GDP by 40%<sup>5</sup> from the current \$14,000 per annum to \$20,000 which is part way toward the target of \$30,000.

***Establishing the right policies towards the production and use of ICT in Korea is central to meeting all three of these challenges.***

## **ICT can substantially improve the productivity of Korea's services sector**

ICT has a central role to play in improving the poor productivity of Korea's services sector. It is the services sector which makes the most intensive use of ICT. For example the retail, wholesale, financial services and business service industries are the main users of ICT in most developed countries and have, over the last decade, made the biggest contribution to productivity growth in leading OECD economies.

ICT contributes to economic growth in two ways:

- through **production** of ICT goods and services
- through **effective use** of ICTs.

Both are important. But in economies like the US and Australia effective use of ICT has become much more important to economic growth in the services sector recently. In the US for example ICT intensive using industries and ICT producers contributed equally to economic growth up to 1995. Since then the ICT using industry has contributed two to three times more growth than ICT producers. Why?

Making effective use of ICT requires "creative destruction" within the economy. To get the biggest productivity gains from use of ICT now requires that:

- firms reengineer business processes rather than simply automate them so as to take advantage of the productivity gains which ICT enables
- new firms, with new business models enabled by ICT, displace existing firms which operate legacy business models.

For a nation to maximise effective use of ICT through creative destruction requires it to meet four main conditions. On the **supply** side Korea's ICT suppliers must provide end users with access to world class ICT products and services at competitive prices and on the **demand** side:

- existing firms need to find it profitable to invest in reengineering business processes. This requires **labour market flexibility** so that firms can retrain staff in new roles, hire new staff and shed redundant staff at low cost
- **product market flexibility** is also required so that new firms can start up, and old ones close down, quickly and cheaply so as to take advantage of new business models enabled by ICT
- the work force must have the right education and skills to use ICT effectively whilst senior managers must understand the potential productivity improvements generated by ICT.

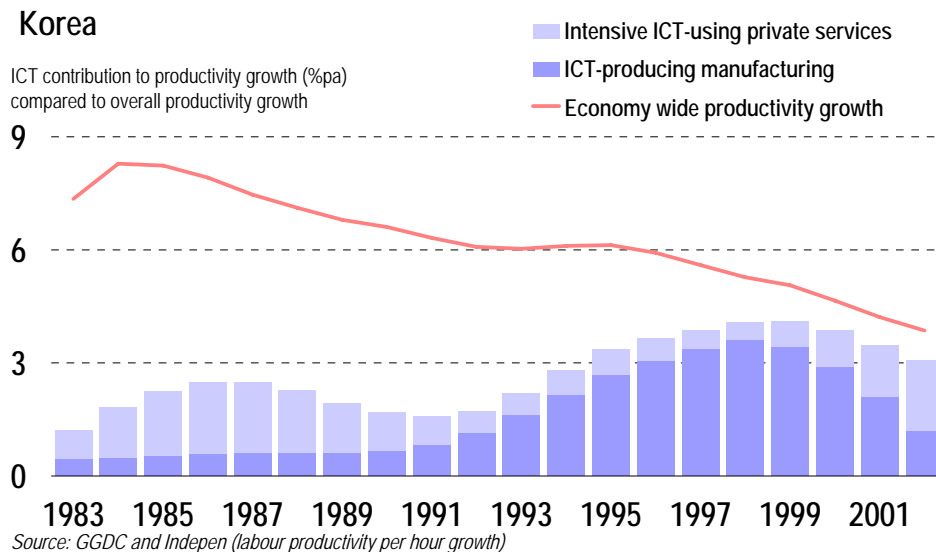
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<sup>5</sup> (93% - 56%/56x60%) - the proportion of the Korean GDP generated by the services sector

## Korea needs policy changes to maximise effective use of ICT

ICT is clearly making a major contribution to productivity growth in Korea as Figure 2 shows. In the 1990s most of that growth came from the ICT producers rather than from the efficient use of ICT. Now the ICT intensive using sector is starting to make a significant contribution.

Figure 2



The evidence of an increase in productivity growth from use of ICT is very welcome. But it is also important to remember that the productivity of Korea's services sector is extremely low. So it will take many years for productivity in this sector to approach OECD norms. In the meantime there are number of measures which the Korean government could take to speed up this process.

In particular we recommend that the Korean Government should:

- **consider fresh measures to further increase its product and labour market flexibility** so as to maximise effective use of ICT and so accelerate productivity improvements in its services sector. Korea operates relatively strong employment protection laws for its regular workforce which raise the costs of Korean businesses when they e-enable business processes. At the same time Korea operates some of the most restrictive product market regulation in the OECD
- **learn from the EU's failures to implement such measures** over the past five years by setting clear, appropriate and focussed objectives for reform
- **take account of the central role which ICT plays in Korea's economic growth in all of its policy formulation.** This means that all public policy formulation should take account of ICT spillover impacts, in the same way that many governments now take account of environmental impacts
- **focus on dealing with underlying causes rather than treating symptoms.** For example Korean businesses are poor at e-enabling business to business transactions. Rather than promoting such applications, government action might be more effective if it concentrated on

considering why Korean businesses behave in this way. Removing barriers to economically desirable behaviour is more effective in the long term

## Korea needs to review its telecommunications regulations

As well as *demand side* measures, maximising effective use of ICT requires that users in Korea have access to world class ICT products and services at competitive prices.

Computer hardware and software are traded on world markets. So, provided there are no trade barriers which prevent Korean users from accessing overseas products in these categories, there are few ICT supply policy issues here.

Telecommunications services are a different matter however. Such services must be produced locally in Korea and they of central importance to effective use of ICT. For example:

- network services are at the heart of the e-enablement of businesses processes
- spend on telecommunications represent a substantial proportion of end-user spend on ICT
- telecommunications services lead directly to productivity improvements.

Korea's telecommunications services industry currently performs significantly better than its counterparts in Australia, France, Germany, Japan, the UK or the US. It offers lower end-user prices; it has achieved much higher penetration levels for fixed and mobile broadband services; it is significantly more productive; and it invests more than the industries of these other six countries. In short Korea's telecommunications service industry has performed better than that of any of the six benchmarked countries.

The Korean telecommunications services industry will need to work hard and make substantial new investments if it is to maintain its leading position. Across the world telecommunications operators are now starting to make major investments in various forms of next generation networks.

The Government has set out ambitious plans to maintain Korea's lead in telecommunications services through its IT 839 strategy document. This calls for the industry to:

- build broadband convergence networks
- move the mobile networks to the W-CDMA standard over the next two to three years
- roll out WiBro broadband services.

In addition the industry has invested substantially in mobile TV services and launched a number of fixed mobile convergence (FMC) devices, so far with limited success. Now it needs to consider whether and how it will build integrated fixed and mobile networks which could deliver higher functionality services at lower unit costs.

The overall picture is one of major investment, rapid change, and a high degree of uncertainty over which investments, services and price packages will generate significant demand. In 2006 for example we estimate that the five main players - KT, SK Telecom, KTF, LG Telecom and Hanaro - will invest \$9.6 billion. If the industry is to make the best possible use of this investment then it is important that the regulatory environment in which it operates is one which encourages investment and innovation by all the main players.

Current regulation does not create such an environment. In particular:

- KT and SK Telecom are currently subject to rate of return regulation on the prices of key retail services
- there are strict rules which restrict, on an ex-ante basis, the price packages which the main telecommunications service providers can offer to end-users
- it is unclear what is meant by *efficient competition* in the Basic Telecommunications Act and how the MIC is supposed to balance requirements to promote competition against requirements to encourage innovation and investment by the main infrastructure operators.

These restrictions are increasingly at odds with a general move by regulatory authorities in other parts of the developed world to restrict the application of ex-ante regulation to cases where there is clear market failure.

To encourage investment and innovation by all the main players over the next five years we recommend that the Korean government should:

- **review and remove regulatory restrictions** unless it is clear that do so would lead to market failure
- **clarify the Telecommunications Business Act of 2000** – either through a guidance note or through legislative amendment – so that the **MIC seeks to maximise the economic welfare of Korea** rather than to maximise competition when it regulates the telecommunications service industry
- **limit ex-ante regulation in the telecommunications service industry** in future and rely more on the ex post regulation of competition law.

## Korea's industrial policy towards ICT needs to change

Korea's current industrial policy prioritises the development and use of ICT as a driver of economic growth. It also focuses on supporting the export of ICT goods. The current policy, as expressed by the IT 839 programme, has the following key characteristics:

- it aims for the Korean ICT industry to develop a strong position in all the new technologies with potential global markets
- there is a strong emphasis on the convergence of network services and platforms
- government ministries play a central role in developing detailed plans and setting targets for the industry to implement
- there is a requirement for telecommunications operators to make major investments in the roll out of new technologies nationwide so as to provide a test-beds and reference sales which Korean equipment suppliers can use as a basis for successful exports.

The current policy has worked well in the past. For example Korea's ICT exports grew from virtually nothing in the mid 1990s to \$80 billion (or 14% of GDP) in 2005<sup>6</sup>. But there are now good reasons to believe that circumstances have changed and that a new model of industrial policy is required. There are a number of problems with the current policy:

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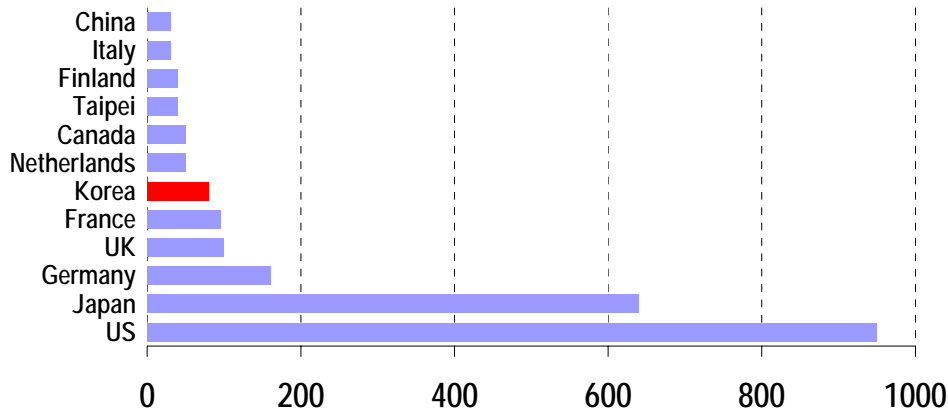
<sup>6</sup> IT Industry Outlook of Korea 2006, KISDI

- **Governments in leading edge countries cannot pick winners successfully.** It is now more difficult for top down planners to identify winning ICTs. Whilst Korea was in catch up mode it was possible for the Government and its agents to identify successful technologies in overseas markets and adopt them for Korea. But Korea is now at the forefront of ICT technologies and this mechanism no longer works
- **Governments are not well placed to pick winners.** The current model of ICT industrial policy gives the Government, its research institutes and the equipment manufacturers in Korea the main responsibility for determining the allocation of resources in terms of network investment as well as R&D. It makes more sense for the network operators, which have a better knowledge of end-user markets than other stakeholders, to be the prime decision makers on network investment
- **The current policy does not maximise effective use of ICT within Korea.** Use of ICT is now the engine of economic growth in developed countries. So it is now much more important to meet market demand for ICT in Korea than it was 10 years ago in order to maximise economic growth. That means adopting a bottom-up market led policy on ICT investment, rather than a top down government led policy
- **The current policy has done little to stimulate communications network equipment exports so far.** Korean equipment suppliers have succeeded in exporting products (GSM phones) where they have no home market but have failed to realise significant export opportunities where they do (CDMA network equipment). So the evidence does not support one of the key premises for the current policy – that Korean manufacturers need home networks to provide a test bed and reference sale if they are to succeed in export markets
- **Other countries have abandoned government led policies.** At one time publicly owned network operators automatically purchased their home produced network equipment as part of a policy of supporting national champions in export markets. They no longer do so
- **The current policy generates inappropriate investment incentives.** Obligations on the network operators to roll out new technologies mean that Korean equipment suppliers have a guaranteed market for their product. This substantially reduces the risks they take and encourages them to develop technologies where they do not have comparative advantage on world markets
- **Current policy does not focus Korean R&D.** The current policy aims to develop a strong position for Korea in all the major ICTs. Yet Korea's R&D capacity is limited as Figure 3 shows. Given the limited resources available for R&D in Korea it makes sense for the Korean government and its manufacturers to focus resources in those areas where it has a clear actual or potential advantage in world markets and to buy-in other technologies where it does not.

Figure 3

## Top 250 ICT companies registers in each country

Revenues generated (\$bn per annum)



Source: Information Technology Outlook 2004, OECD

Given these problems we propose that the Korean government should consider modifying its industry policy towards ICT in four ways:

- the Government should move from **the current command and control** approach to developing and deploying ICTs in Korea to one which is **more market led**
- the Government should develop a new industrial policy towards the ICT sector in which **the limits of intervention by responsible line ministries are made explicit**
- to help move to a more market led policy Korea's **network operators should be free to choose which technology to deploy and from whom to buy it**, whether a Korean or overseas network equipment supplier
- given the limitations on Korean resources and the importance of R&D for success in ICT manufacturing<sup>7</sup>, **Korea should focus its efforts on those technologies where it has comparative advantage** and buy in other technologies from foreign firms.

### The Korean Government should support exports of ICT services

ICT exports represent an important driver of economic growth in Korea. So far almost all of these exports have been manufactured goods. At the same time the services sector is growing in importance throughout the world and the manufacturing sector is shrinking. In combination these trends suggest that the Korean government should consider supporting exports of ICT services as well as ICT goods.

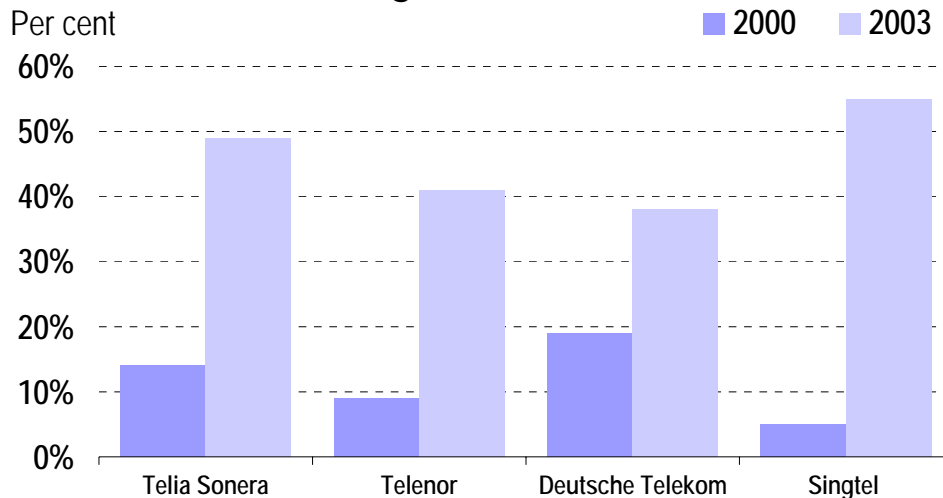
The obvious ICT based service for Korea to export is mobile telecommunications services. Lack of use of the Korean language outside Korea, together with limited English language use in Korea imposes a significant constraint on Korea's ability to export value added and content based services. And the opportunity to expand successfully in fixed network services is limited by the "last mile" access problem. This limitation does not apply to mobile services.

<sup>7</sup> This was a major driver behind the recent announcement of the Alcatel/Lucent merger

It is clear that mobile operators in other countries have successfully exported overseas – both into developing and developed countries. As Figure 4 shows foreign operators have grown their overall revenues (and profits) substantially as a result of exporting their expertise and capital. There are opportunities for Korea's mobile operators to do the same.

Figure 4

### Revenues from foreign businesses



Source: Communications Outlook 2005, OECD with Ovum estimate for Singtel

The prospects for Korean mobile operators in overseas markets look reasonable:

- there are still substantial growth opportunities in overseas mobile markets, especially in Africa and South East Asia
- Korean mobile operators are clearly very efficient by world standards. So, providing they can transfer such practices to their overseas operations, this gives them a competitive advantage
- Korean operators might enter overseas markets using third generation mobile technologies which would allow them to operate at lower unit costs and offer a wider range of services than rivals in those markets can currently offer.

Such exports should help the Korean economy in a number of ways. For example it should:

- help to increase Korea's services exports in a world where services are becoming more important and increasingly globalised
- help to align the interest of Korea's mobile operators more closely with those of its ICT manufacturers.
- create opportunities for strategic alliances between exporting mobile operators and Korean equipment manufacturers and value added service providers
- help open up Korea to global influences. As globalisation increases, economies need to be open to the rest of the world in terms of exchange of ideas, talent and services as well as manufactured goods. Export of ICT services, which require a good understanding of foreign



cultures and markets to succeed, should help significantly in the further globalisation of the Korean economy.

Given this analysis we recommend that the Korean government ***should support efforts by the Korean telecommunications services industry to export overseas.***