

## MEASURING SUCCESS – KEY METRICS

When dealing with any complicated, dynamic environment, measuring performance is never easy. Such difficulty is compounded when dealing with a market as immature as broadband. What will constitute success? Once measures of success have been decided, how should they be interpreted?

Broadband market indices have been developed to measure and compare the attractiveness and performance of the broadband market across a range of countries. The underlying principles used to develop the indices that comprise the broadband market index are:

- simplicity – the index must be transparent and easy to explain and understand
- quantifiable – the data to be used in the index must exist in a consistent manner across all the countries studied
- realistic – it should give as realistic an impression as possible as to the status of broadband in a given country.

In these situations it is sensible to start from an end goal and work backwards. In the UK's case, the goal is to have the most extensive and competitive broadband market in the G7 by 2005. Therefore, extensiveness and competitiveness are clearly the two criteria that will need to be measured. These words do not naturally lend themselves to measurement and are intrinsically subjective.

Analysys has worked closely with the Office of the e-Envoy and the Broadband Stakeholders Group (BSG) to agree quantifiable measures of success. Consensus has emerged around a dashboard of six indicators. A range of indicators enables a deeper understanding of the relative strengths and weaknesses of each international market that cannot be attained from a single aggregated measure. A further advantage is that causes (e.g. regulation, competition) can be separated from effects (e.g. price and take-up) and analysed independently. This section presents definitions for each dashboard indicator and the rankings for 11 countries studied.

### Definition of indices

Six key measures of success have been identified: price, choice, regulation, availability, addressable market and take-up. These are calculated as standardised indices (i.e. numbers between 0 and 1, where 0 represents poorest performance and 1 represents best performance). Weightings are attached to these different indices to produce extensiveness and competitiveness indices, against which countries can be ranked. All indices are normalised to give a value between 0 and 1, so that the weightings applied to each index are transparent. All indices are calculated based on the situation at the end of August 2002. Price changes that were announced at this time, such as price reductions relating to DSL services in the UK market, have been included even if they were not operational at this date.

## 1. Choice index

The choice index is comprised of three equally-weighted parameters:

- market share concentration – sum of the squares of the top three infrastructure player markets shares
- infrastructure competition – sum of coverage (percentage of households) provided by each infrastructure player
- active retail operators – number of service providers with greater than 5% share of the retail market.

The UK is ranked fifth in the eleven countries studied and fourth in the G7.

<i>Rank Aug 2002</i>	<i>Rank Feb 2002</i>	<i>Rank Aug 2001</i>	<i>Country</i>	<i>Choice index</i>
1	2	2	Japan	0.95
2	1	1	USA	0.84
			South Korea	0.74
3	3	3	Canada	0.72
4	4	4	UK	0.71
			Sweden	0.54
			Australia	0.47
5	5	5	France	0.28
6	6	6	Italy	0.27
7	7	7	Germany	0.20
			Ireland	0.18

**Figure 1:**  
*Choice index*  
[Source:  
*Analysys*]

## 2. Price index

The price index is calculated as the average price of a mass market broadband connection, adjusted for purchasing power parity (PPP), and weighted by the availability of the different technologies. Prices used are for the leading residential broadband offering for each technology (e.g. BTopenworld price used for UK ADSL prices). The index is normalised to give values between 1 and 0 – a high index number indicates low prices. The UK continues to rank third in the G7, though it has slipped to fifth of the 11 countries studied from fourth place, due to the strong performance of South Korea where prices have continued to fall aggressively.

<i>Rank Aug 2002</i>	<i>Rank Feb 2002</i>	<i>Rank Aug 2001</i>	<i>Country</i>	<i>Price index</i>
1	1	2	Japan	1.00
			Sweden	0.84
2	2	1	Canada	0.81
			South Korea	0.73
<b>3</b>	<b>3</b>	<b>6</b>	<b>UK</b>	<b>0.67</b>
4	4	4	Germany	0.66
5	5	3	France	0.61
6	6	5	USA	0.57
			Australia	0.51
7	7	7	Italy	0.34
			Ireland	0.00

**Figure.2:***Price index**[Source:**Analysys]*

### 3. Regulation index

The regulation index compares and contrasts the broadband market actions taken by regulators in each country. The regulation index is based on simple, binary scores for the presence (or absence) of regulatory provision for:

- wholesale DSL
- wholesale Cable
- local loop unbundling (LLUB) – mandated
- access upstream of MDF
- line sharing
- separation of network ownership.

The index does not provide a measure of the success of policy implementation. On this simple index, the UK continues to hold the joint second position of both the eleven countries studied and the G7.

<i>Rank Aug 2002</i>	<i>Rank Feb 2002</i>	<i>Rank Aug 2001</i>	<i>Country</i>	<i>Regulation index</i>
1	1	1	USA	1.00
2	2	2	Canada	0.67
<b>2</b>	<b>2</b>	<b>2</b>	<b>UK</b>	<b>0.67</b>
			South Korea	0.67
4	4	4	Japan	0.33
			Australia	0.33
5	5	5	France	0.33
			Sweden	0.33
6	6	7	Italy	0.33
			Ireland	0.33
7	7	6	Germany	0.00

**Figure.3:**  
Regulation index [Source: Analysys]

#### 4. Availability index

Availability index is a measure of the percentage of the population with access to a terrestrial broadband solution (again it is normalised to give a value between 0 and 1). The UK is placed sixth (or fifth in the G7), having overtaken Australia, Sweden and Italy<sup>1</sup>.

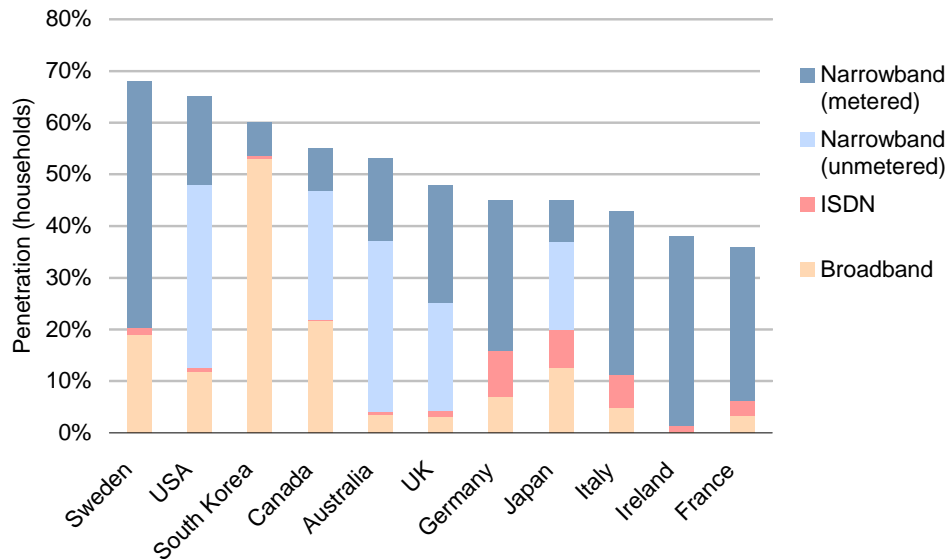
<i>Rank Aug 2002</i>	<i>Rank Feb 2002</i>	<i>Rank Aug 2001</i>	<i>Country</i>	<i>Availability index</i>
			South Korea	1.00
=1	1	1	Germany	1.00
=1	4	4	Japan	1.00
3	2	2	Canada	0.78
4	5	5	USA	0.56
<b>5</b>	<b>6</b>	<b>6</b>	<b>UK</b>	<b>0.49</b>
			Australia	0.44
			Sweden	0.44
6	7	7	France	0.38
7	3	3	Italy	0.33
			Ireland	0.00

**Figure.4:**  
Availability index [Source: Analysys]

<sup>1</sup> The estimate for coverage in Italy has been revised down from 80% to 60%

## 5. Market context (potential) index

Countries with a high penetration of services that are 'part way' towards broadband (i.e. flat rate narrowband, ISDN and digital TV) have a large pool of subscribers, who may quickly switch over to broadband given certain circumstances. Hence countries with high flat rate, ISDN, or DTV penetration could expect an accelerated growth in broadband penetration, once broadband prices are close to flat rate prices, the applications for which broadband is essential increase in attractiveness and (or) digital TV becomes a competitive platform for broadband delivery.



**Figure 5:** Residential Internet Penetration [Source: Analysys]

Flat rate Internet access is available in a number of countries (e.g. the USA, Canada, Australia), due to local calls being either untimed, or bundled with line rental. For example in the USA<sup>2</sup> local calls are 'free' (effectively bundled with line rental) and in Australia local calls are a set cost, regardless of duration. Hence if the call to the ISP can be made via a local number (most cases) then the telephony element is flat rate. Payment to the ISP occurs on top of this charge and can either be a flat fee per month, or based on some sort of usage measurement (volume, time). For example, in the USA, America Online Inc (AOL) is available for a fixed monthly fee of USD20, or USD10 per month plus a charge of USD2.95 per hour (first five hours per month free). Similar price packages are available in Canada, Australia and Japan. Data on the breakdown of which price plans subscribers have adopted is scarce, however, the trend is towards flat rate prices except for low users.<sup>3</sup>

The UK is unusual in that flat rate services are available (via FRIACO or cable operators), even though local calls are metered. In other countries where local calls are metered e.g. Germany the

<sup>2</sup> There are a small number of exceptions where local calls are not 'free' e.g. NYC

<sup>3</sup> Assumption is that 75% of users are on a flat rate package from their ISP, if untimed local calls are available

availability of flat rate services is very limited. The high levels of take-up of flat rate services in the UK (approximately three million subscribers) indicate that if the gap between broadband and flat rate prices is reduced, or compelling applications emerge then the UK could see a fast migration of flat rate users (who are familiar with paying monthly fees) over to broadband. This potential market is captured in the market context index as a measure of potential acceleration of broadband, where equal weighting is given to ISDN, flat rate and digital TV subscribers and then normalised to give an output between 0 and 1.

The UK continues to rank third among the G7 and fourth of all the countries studied, and this relatively high ranking is due to the availability of flat rate services and because the UK has the highest penetration of digital TV out of the countries studied.

<i>Rank Aug 2002</i>	<i>Rank Feb 2002</i>	<i>Rank Aug 2001</i>	<i>Country</i>	<i>Market context index</i>
1	1	1	USA	1.00
			Australia	0.97
2	2	2	Japan	0.89
<b>3</b>	<b>3</b>	<b>3</b>	<b>UK</b>	<b>0.89</b>
4	4	4	Canada	0.74
5	5	5	Italy	0.40
6	6	6	France	0.36
7	7	7	Germany	0.34
			Sweden	0.24
			Ireland	0.11
			South Korea	0.00

**Figure.5:**  
*Market context index [Source: Analysys]*

## 6. Take-up index

The take-up index is a measurement of household broadband penetration. To qualify as broadband, a service must be capable of delivering individually tailored services to each individual at data rates in excess of 256kbit/s. This definition excludes the current digital TV offerings, however, it is expected that over time digital TV offerings may evolve to meet the above definition and will then be included in the take-up numbers.

Despite the encouraging recent growth rates of broadband the UK remains seventh in the G7. The UK's strong position in leading indicators such as market context suggest that take-up is set to improve significantly, although other countries will also be continue to develop in this area.

<i>Rank Aug 2002</i>	<i>Rank Feb 2002</i>	<i>Rank Aug 2001</i>	<i>Country</i>	<i>Take-up index</i>
			South Korea	1.00
1	1	1	Canada	0.41
			Sweden	0.36
2	3	4	Japan	0.23
3	2	2	USA	0.22
4	4	3	Germany	0.13
5	5	5	Italy	0.09
			Australia	0.06
6	6	6	France	0.06
<b>7</b>	<b>7</b>	<b>7</b>	<b>UK</b>	<b>0.06</b>
			Ireland	0.00

**Figure.6:***Take-up index**[Source:**Analysys]*

### The 2005 government target

The government target is to have the most competitive and extensive broadband network by 2005. The target may therefore be broken down into the two factors – competitiveness and extensiveness – which combine to provide the overall market environment for Broadband. We can define these two factors in terms of the relevant dashboard indicators as follows:

- *competitiveness* is defined as a composite measure of the market regulation index (a leading indicator), market choice, and price (a lagging indicator) – these are weighted: regulation (1), choice (3) and price (3)
- *extensiveness* is defined as a composite measure of market context (a leading indicator) and Broadband availability – these are weighted market context (1) and availability (2).

These indices also allow us to separate cause (competitiveness, extensiveness) and effect (take-up).

<i>Rank Aug 2002</i>	<i>Rank Feb 2002</i>	<i>Rank Aug 2001</i>	<i>Country</i>	<i>Competitiveness index</i>
1	1	3	Japan	0.88
2	2	2	Canada	0.75
=2	2	1	USA	0.75
			South Korea	0.72
<b>4</b>	<b>4</b>	<b>4</b>	<b>UK</b>	<b>0.69</b>
			Sweden	0.64
			Australia	0.47
5	5	5	France	0.43
6	6	6	Germany	0.37
7	7	7	Italy	0.31
			Ireland	0.13

**Figure.7:**  
*Competitiveness  
index [Source:  
Analysys]*

The UK arguably remains one of the most competitive broadband markets in Europe, ahead of those countries with less infrastructure competition or lower retail competition in the absence of wholesale DSL services. Based on our competitiveness index, the UK is currently in fourth place in the G7, ahead of France, Italy and Germany.

The UK's overall ranking is unchanged since the last report. The UK has continued to close the gap on leading broadband countries such as the USA and Canada, whilst moving further ahead of countries such as France where competition is less than ideal. With continued infrastructure and retail competition putting further downward pressure on prices, we expect the UK to climb up the competitiveness rankings.

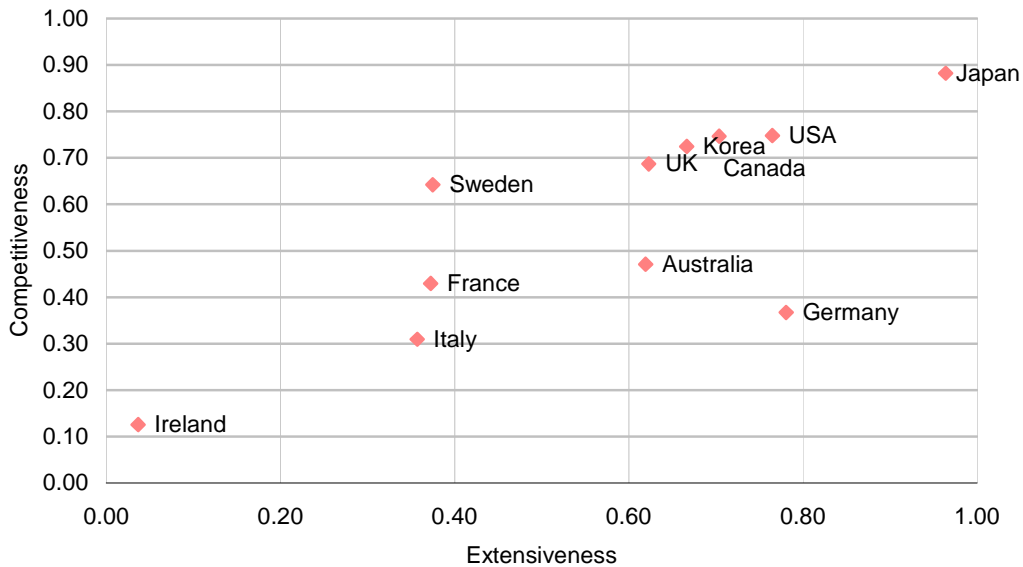
<i>Rank Aug 2002</i>	<i>Rank Feb 2002</i>	<i>Rank Aug 2001</i>	<i>Country</i>	<i>Extensiveness index</i>
1	1	1	Japan	0.96
2	4	4	Germany	0.78
3	3	2	Canada	0.76
4	2	3	USA	0.70
			South Korea	0.67
<b>5</b>	<b>5</b>	<b>5</b>	<b>UK</b>	<b>0.62</b>
			Australia	0.62
			Sweden	0.37
6	7	7	France	0.37
7	6	6	Italy	0.36
			Ireland	0.04

**Figure.8:**  
*Extensiveness index  
[Source: Analysys]*



Against the extensiveness indicator, a combination of availability and addressable market, the UK currently continues to lie in fifth place in the G7. However, it is expected that the UK's position will improve with increased broadband roll-out and continued growth in the take-up of Internet and interactive digital TV services.

A plot extensiveness versus competitiveness indicates that whilst it may be challenging to develop a competitive and extensive broadband network the two goals are not mutually exclusive, as shown by the position of countries such as Canada, Japan and the USA.



**Figure 10:** Extensiveness versus Competitiveness [Source: Analysys]

While developing the measures of success it was agreed that quality of service should also be considered for future international comparisons. This would require direct measurement of end-to-end performance at various times of day, for each package/provider, to a defined series of benchmark services. The model was felt to be Oftel's monitoring programme of the various cellular networks. The very high contention ratios used on a variety of "broadband" platforms and in various countries mean that services sometimes offered end-to-end performance little better than narrowband during peak periods.