While we often talk of globalisation as making the world a “smaller place”, in our day-to-day surroundings some things are undoubtedly getting bigger. Skyscrapers are taller, bridges are longer and we are now flying aircraft with a wingspan equivalent to a soccer pitch.

Organisations are also growing in size. Wal-Mart Stores is the world’s largest publicly traded employer with a total of around 2.2 million staff, a figure unthinkable 100 or even 50 years ago.

The question of whether bigger is better from an organisational perspective is one that has long been debated. There is no clear evidence on the link between size and performance, a relationship that will also evolve over time as technology and communication change the way organisations do business.

Economies of scale

Economies of scale is an important concept, supporting the idea that bigger is indeed better from a cost-efficiency perspective. The theory proposes that as production output increases, firms are able to achieve a lower cost per unit.

A number of factors may drive this relationship, including specialisation of labour or the ability of larger firms to invest in specialist capital machinery that may not be cost-effective for a smaller supplier. The existence of fixed costs in either the labour or assets that are needed to produce the first unit of output is another feature of industries where increasing scale can reduce unit costs.

To set up a commercial airport there are a number of large fixed expenditures that are required for even the minimum level of operation. As airport throughput increases, the fixed investment cost is spread over a larger number passengers or departures, decreasing unit cost.

Low traffic levels constrain the ability of airports to exploit economies of scale, resulting in smaller airports trying to identify techniques for cutting fixed costs. One recent example is the strong interest in remote tower technology.

Analysis supports CANSO in its mission to be “the global voice of air traffic management in the transformation of the aviation system”. To be effective as the voice of the industry, CANSO is right to work on developing a deeper understanding of the industry it represents.

Combining airport tower operations across a number of airports would allow operators to spread the cost of the fixed investment more broadly.

Airlines can also reduce their average cost per passenger by expanding their operations. While evidence suggests that the benefits of fleet expansion are limited,
Collating data from providers across the industry allows questions to be posed about the state and nature of the industry a whole. The introduction of the industry view to this year’s report tries to do just this, taking the entire data sample and looking at trends and key messages.

Economies of scale also exist through increases in passenger density. Increased passenger density on a given route allows airlines to operate larger, more efficient aircraft and reduces the cost per passenger of fixed cost support functions.

Over the last 10 years, airlines have taken advantage of economies of scale, in a difficult market environment, through mergers and increased integration. In 2013, US Airways and American Airlines merged to create the world’s largest airline as the latest in a number of mergers or acquisitions within the US.

Cost-efficiency in ANS

While economies of scale do seem to exist in airport and airline markets, is it the case for ANS that bigger is indeed better? This year’s CANSO Global Air Navigation Services Performance Report 2014 takes a global view of the question from a cost efficiency perspective.

It would be reasonable to expect fixed asset investment costs in ATM systems to result in economies of scale within ANS provision. A larger scale operation may also allow ANSPs to manage staff resources more efficiently and to maximise controller output – for example, through the optimisation of sector configuration.

The 2013 CANSO data shows no clear relationship between IFR flights controlled and unit cost although there is some evidence of a positive relationship between size and ATCO productivity.

This supports the idea that larger ANSPs are better able to manage the balance between capacity and demand, for example through improved ATCO resourcing and the optimisation of staff rostering. Because the benefits of scale for productivity are not reflected in the unit cost data, however, this may suggest some degree of diseconomies in other costs.

For example, larger operations may also face greater risk and associated costs from large and complex capital investment projects. This is in line with the fact that in Europe the five largest ANSPs account for a larger proportion of total costs than total traffic.

Defining “bigger”

The lack of relationship between size and performance may also be explained by how we define “bigger”. In the Global Air Navigation Services Performance Report 2014, the relationship between cost efficiency and ANSP size is explored, as measured by the number of flight hours controlled.

This does not take account of the size of the ATC centre. So, if economies of scale are actually to be found in the use of larger ATC centres then this may explain the lack of clear relationship between size and cost in the current data set.

Indeed, other studies do point to economies of scale at centre level, notably in equipment, buildings and maintenance costs. However, gains are not limitless. There may come a point where difficulties in co-ordination and in
providing contingency back-up may start to outweigh fixed cost savings.

A better understanding of the nature of the relationship is needed. If economies of scale exist only at a centre level then improved performance will be supported by the construction of larger centres, rather than consolidation at a service provider level. Collating performance data helps answer questions about the industry as a whole.

Being able to address questions such as the impact of scale on cost effectiveness is an important goal of the Global Air Navigation Services Performance Report 2014. Collating data from providers across the industry allows questions to be posed about the state and nature of the industry as a whole. The introduction of the industry view to this year’s report tries to do just this, taking the entire data sample and looking at trends and key messages.

A view of the industry performance is important to CANSO Members in giving a general view of the market operating context and in their internal assessment of their performance compared with the industry average.

An industry-level analysis also supports CANSO in its mission to be “the global voice of air traffic management (ATM) in the transformation of the aviation system”.

To be effective in its role as the voice of the industry and in advocacy activities CANSO is right to work on developing a deeper understanding of the industry it represents.

Operations and institutions

A complete understanding of cost efficiency, including the relationship between scale and performance requires analysis of the impact of external factors. The operational and institutional environments also drive unit cost.

The operational environment of the ANSP has a significant impact on the potential cost-efficiency of controlling an average flight hour. This includes traffic complexity factors such as density.

The resources required to control different parts of a flight also impact the average unit cost. It is widely accepted that en-route services result in lower ATCO workload than approach services when measured in IFR flight hours.

These factors should be accounted for when making any concrete statements about the relationship of performance and scale.

Contextual analysis

Context is an important area for development in the Global Air Navigation Services Performance Report 2014 and data collection activities.

A more complete data collection, greater participation, and an understanding of the performance context will support the use of the data in assessing industry performance.

This is also the case for Members for whom the data can be used as part of a performance comparison.

Accurate benchmarking of performance indicators between ANSPs should also account for the impact of external factors such as the operational environment. Part of the role of the CANSO Global Benchmarking Workgroup (GBWG) is to develop contextual analysis.

At the April 2015 GBWG meeting, the agenda includes terminal versus en-route workload and the development of global indicators that account for the impact of the difference in workload on the comparability cost-efficiency indicators.

The data to answer the question – in ANS, is bigger always better? – is not yet available. But the analysis provided this year raises some avenues for investigation. As CANSO performance activities continue to develop, the aim is to dig further into the relationship between scale and performance and its implications for the industry. 

Kate Snow project managed the Helios contribution to the Global Air Navigation Services Performance Report 2014. The report was released in December 2014 and can be downloaded at www.canso.org

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The CANSO Global Benchmarking Workgroup

The CANSO Global Benchmarking Workgroup was formed in 2004 as a platform to promote benchmarking and the sharing of best practices between CANSO Members. It has overseen the production of the Global Air Navigation Services Performance Report since 2009 and meets twice a year to discuss this and other benchmarking or performance issues.

The next workgroup meeting will be held 8-10 April 2015, hosted by the FAA in Washington DC. For further details please contact Paul Cripwell (NAV CANADA), the workgroup Chair at paul.cripwell@navcanada.ca