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# Scotland's Innovation Performance: a review of recent evidence

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## 1. Introduction

This paper summarises recent data on Scotland's innovation performance and how this compares to other countries, using data from the UK Innovation Survey and the European Union's Community Innovation Survey.

The paper assesses the reasons for Scotland's absolute and relative improvement in innovation activity by examining the performance of individual types of innovation. The paper concludes that although Scotland's headline innovation performance has improved, this has been driven more by improved performance of 'organisational innovation' than by companies introducing new products, services or processes. This implications of this for company performance are unclear.

## 2. Why is innovation important?

The importance of innovation in driving economic growth is well established. Innovation is a critical factor for determining productivity growth, for example new and improved products/services can boost business sales and increase value add, and new processes or better organisation can increase efficiency<sup>9</sup>.

Research shows that innovative businesses grow twice as fast, both in employment and sales, as businesses that don't innovate<sup>10</sup>.

The proportion of businesses that are innovating is a key indicator in the 'The Scotland Can Do' measurement framework<sup>11</sup>.

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<sup>8</sup> Scottish Enterprise is Scotland's main economic development agency.

<sup>9</sup> Productivity Handbook, ONS

<sup>10</sup> Business Growth and Innovation, Nesta 2009

<sup>11</sup> <http://www.cando.scot/indicators/innovating-business/>

### 3. Innovation data sources

This paper considers the measure of ‘innovation active’, and performance in 2012-14 compared to 2010-2012. A business is defined as being innovation active if it is engaged in any of the following activities<sup>12</sup>:

1. Introduction of a new or significantly improved product (good or service) or process;
2. Engagement in innovation projects not yet complete or abandoned;
3. New and significantly improved forms of organisation, business structures or practices and marketing concepts or strategies

A key source of internationally comparable data on business innovation activity is the Community Innovation Survey (CIS) that provides information for EU member states and a number of ESS member countries<sup>13</sup>. The CIS is a harmonised survey of innovation activity in businesses with 10 or more employees<sup>14</sup>, designed to provide information on the innovativeness of countries’ businesses, on different types of innovation and on various aspects of the development of an innovation, such as objectives, sources of information, public funding and innovation expenditures. The CIS provides statistics broken down by country, type of innovation, sector and business size.

The UK Innovation Survey is the source of CIS UK data<sup>15</sup>. The UK survey includes data for Scotland which can be used to compare innovation performance relative to other UK regions. Given the contribution that businesses with 10 or more employees make to the Scottish economy, they account for around 73% of total employment and 84% of total turnover, the survey provides important evidence on Scotland’s innovation performance.

### 4. Scotland’s Innovation Performance

Scotland’s innovation performance in the survey period 2012-2014 improved significantly compared to the 2010-2012. In 2010-2012 the proportion of innovation active businesses was 47% with Scotland ranked 19<sup>th</sup>. This places Scotland in the third quartile of comparator European countries. In 2012-2014, the proportion increased to 56%, with Scotland ranked in 9<sup>th</sup> equal place (with France) at the top of the second quartile of comparator countries.

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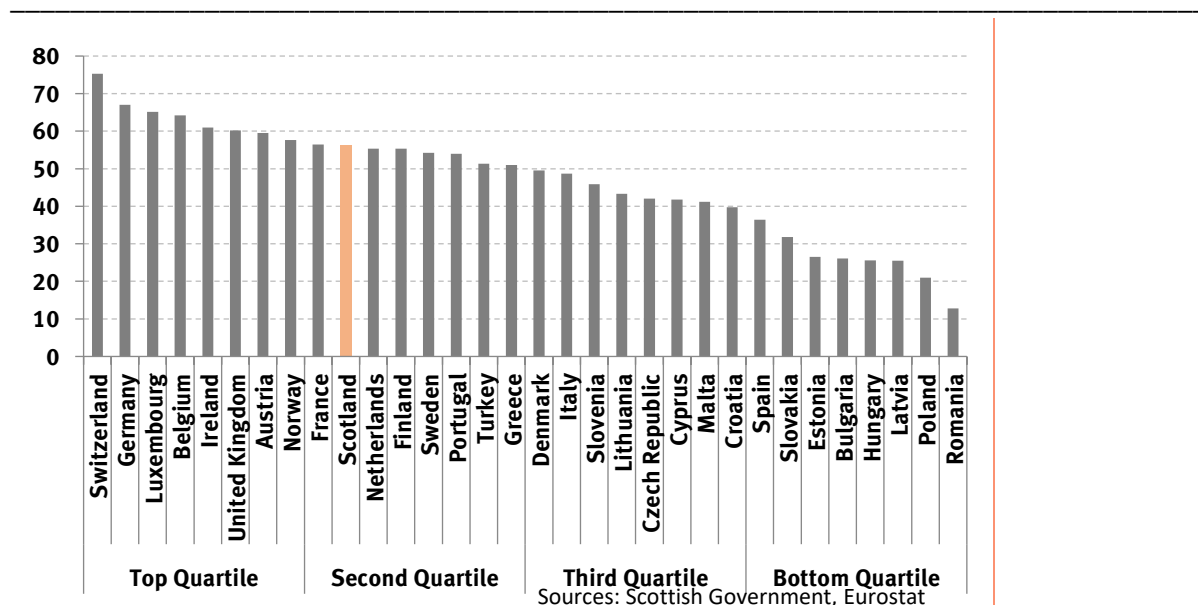
<sup>12</sup> This is the EU wide definition of innovation active adopted by Eurostat.

<sup>13</sup> The CIS dataset is included in the Science and Technology Section of the Eurostat Database. [See Eurostat description of the dataset](#)

<sup>14</sup> So excludes businesses with less than 10 employees

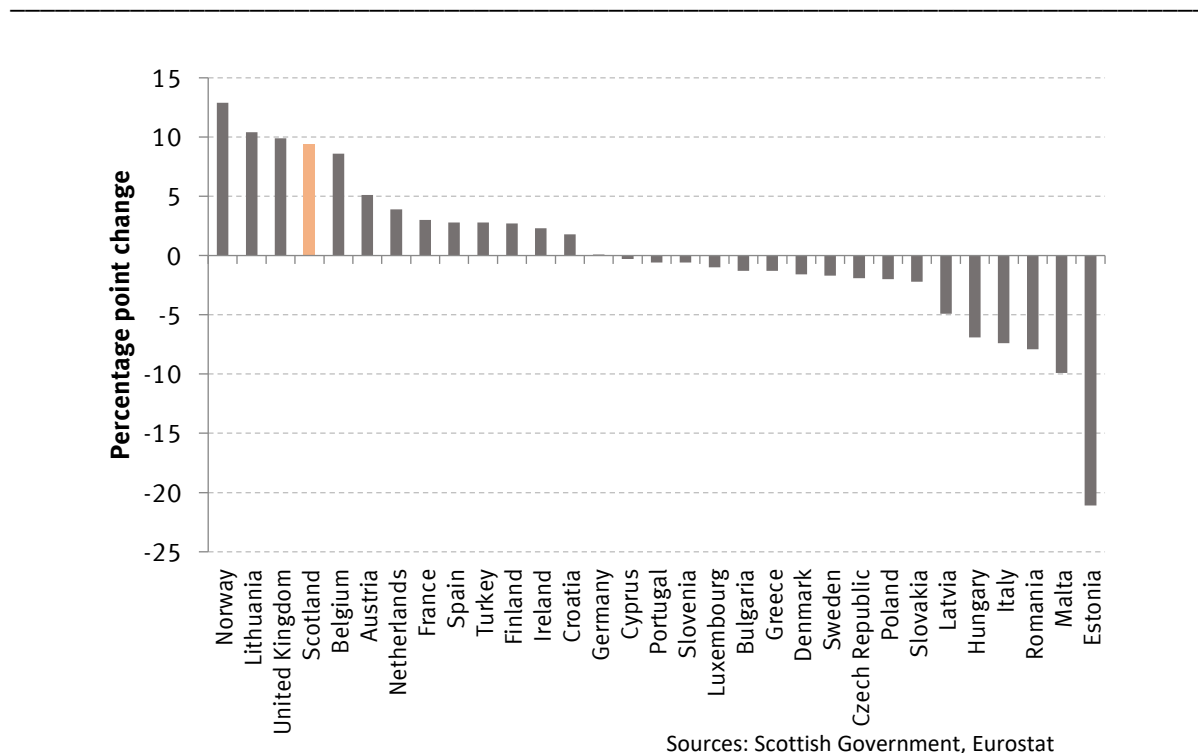
<sup>15</sup> [UK Innovation Survey covering the period 2012 to 2014, BIS](#)

**Figure 1: Innovation Active, % of Businesses 2012-2014**



Compared to other countries, Scotland had the fourth largest percentage point increase in the proportion of innovation active businesses between the 2010-12 and 2012-14 surveys.

**Figure 2: Growth in % of Innovation Active Businesses 2010-12 to 2012-14**



## 5. What types of innovation are driving Scotland's improved overall innovation performance?

In practice, businesses are often engaged in one or more of the activities listed in section 3. The data show that most innovation activity by Scottish businesses is product and/or process innovation, and organisation and/or marketing innovation. The proportion of businesses in Scotland involved in these activities in 2014 is shown in the table below.

### Scotland's Innovation Activity

Activity	% of businesses
Innovative Active	56.4
▪ Product and/or process innovation	38.6
▪ Organisation and/or marketing innovation	43.3

A review of more detailed data within these categories helps to highlight specific areas of improvement. As some businesses engage in a single innovation activity only while others engage in multiple activities, the results for both types of innovators are shown below<sup>16</sup>:

- multiple – businesses that are involved in a particular type of innovation activity, as well as other types of activity
- single – businesses that are involved in just one type of innovation only

In the product example below, this shows that 7% of businesses in Scotland are product only innovators (and are not doing any other type of innovation), whereas significant more businesses (25%) undertake product *and* other types of innovation.

<sup>16</sup> see Appendix 1 for an overview of the types of innovation activity

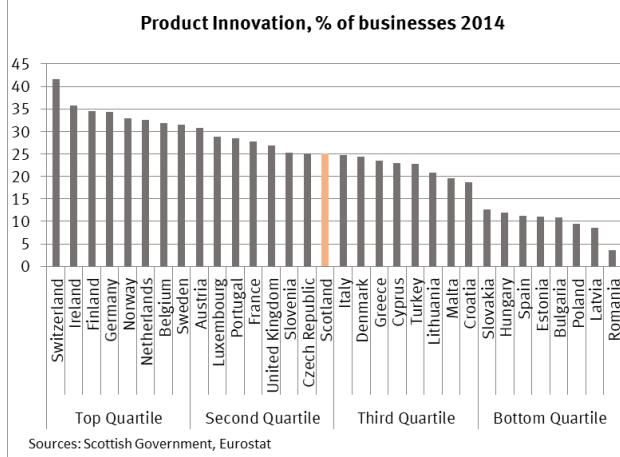
## Product innovation

Scotland's quartile 1 performance in product only innovation was broadly maintained between 2012 and 2014, falling by only 0.3 percentage points. This means that overall improvement in product innovation was driven by businesses engaging in product innovation plus other innovation activities, which increased by 4 percentage points.

Scotland's **Product Innovation** performance improved between the 2012 and 2014 surveys. In 2014 Scotland ranked 15<sup>th</sup> out of 32 countries and moved up to the 2nd quartile of comparator countries.

### Product Innovation Performance

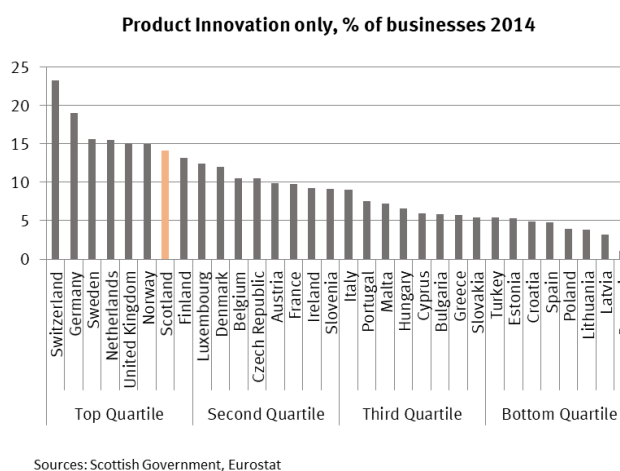
	2012	2014
International Rank	18	15
Quartile	3	2



The proportion of Scottish businesses engaging in product innovation **only** was broadly the same in 2014 as it was in 2012, and in the top quartile of countries.

### Product Innovation Only

	2012	2014
International Rank	4	6
Quartile	1	1



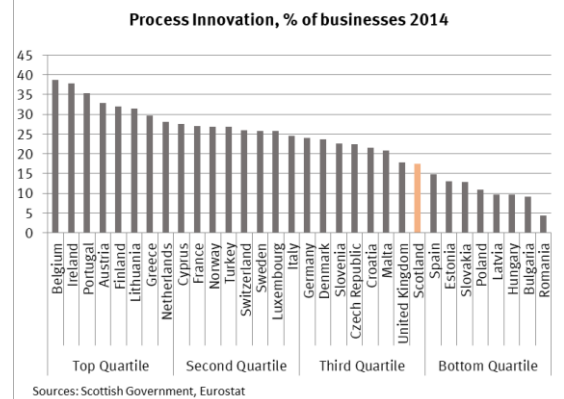
## Process Innovation

The proportion of Scottish businesses engaging in process only innovation increased by 3.3 percentage points between 2012 and 2014. However, overall improvement was driven by the proportion of businesses engaging in process plus other innovation activity, which increased by 7.7 percentage points.

Scotland's **Process Innovation** performance improved between the 2012 and 2014 surveys. In 2014 Scotland ranked 24<sup>th</sup> out of 32 countries and moved up to third quartile of comparator countries.

### Process Innovation Performance

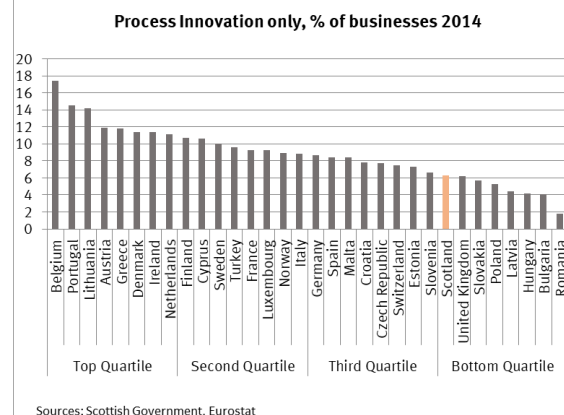
	2012	2014
International Rank	29	24
Quartile	4	3



The proportion of Scottish businesses engaging in process innovation **only** increased by 6 places in the ranking of comparator countries.

### Process Innovation Only

Scotland's	2012	2014
International Rank	30	24
Quartile	4	3



## Organisational innovation

The proportion of businesses engaging in organisation only innovations increased by 4.2 percentage points between the 2012 and 2014 surveys. However, the proportion of businesses engaging in organisational plus other innovations increased by 6.8 percentage points.

**Organisational Innovation** shows the most dramatic improvement in Scotland between the 2012 and 2014 surveys. Scotland's ranking improved to 5<sup>th</sup> place out of 32 countries and moved to the top quartile of comparator countries.

### Organisational Innovation Performance

	2012	2014
International rank	12	5
Quartile	2	1



Scotland maintained its top quartile ranking in the proportion of businesses engaging in organisational innovation only between 2012 and 2014.

### Organisational Innovation Only

	2012	2014
International Rank	1	1
Quartile	1	1





## Marketing innovation

The proportion of businesses engaging in marketing only innovation increased by 1.7 percentage points between 2012 and 2014, therefore, most of the overall improvement was due to the 4.3 percentage point increase in businesses engaging in marketing as well as other innovations.

**Marketing Innovation** performance is weak in Scotland, but some improvement was reported between the 2012 and 2014 surveys. Although still in the bottom quartile of comparator countries in 2014 Scotland's ranking had gone up from 31<sup>st</sup> in 2012 to 25<sup>th</sup> in 2014.

### Marketing Innovation Performance

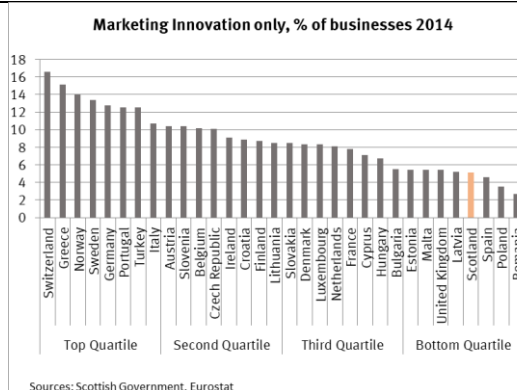
	2012	2014
International rank	31	25
Quartile	4	4



Scotland's ranking for the proportion of marketing only innovators increased by 3 places between 2012 and 2014, but also remained in the bottom quartile.

### Marketing Innovation Only

	2012	2014
Scotland's Rank	31	28
Quartile	4	4



The data for multiple innovation activities show that Scotland still has relatively poor performance compared to other countries. In Process and Marketing Innovation, and Product Innovation Scotland just makes it into the second quartile of comparator countries while the performance is high for organisational innovation.

Overall, to reach the top quartile of comparator countries for overall innovation active performance, Scotland would only need an extra 250 10+ employee businesses to become innovation active. However, the gap between Scotland and comparator countries engaging in multiple innovation activities is much larger:

<b>Multiple Innovators - Innovation Type</b>	<b>Number of additional 10+ employee businesses required to reach the top quartile</b>
Product Innovation	1,500
Process Innovator	2,700
Marketing Innovators	3,000
Organisational Innovators	0

The data on Scotland's performance by type of innovation activity helps explain Scotland's improved performance for the overall headline innovation active measure. Scotland's ranking has increased from 19<sup>th</sup> to 9<sup>th</sup> by improving or maintaining its ranking performance for *all* the component types of innovation activity, except for the proportion of companies that are only involved in product innovation.

The data though also shows that Scotland's overall relatively high innovation activity ranking (9<sup>th</sup> place) is driven in large part by businesses undertaking organisational innovation only, and that Scotland's businesses are far less likely than those in other countries to be:

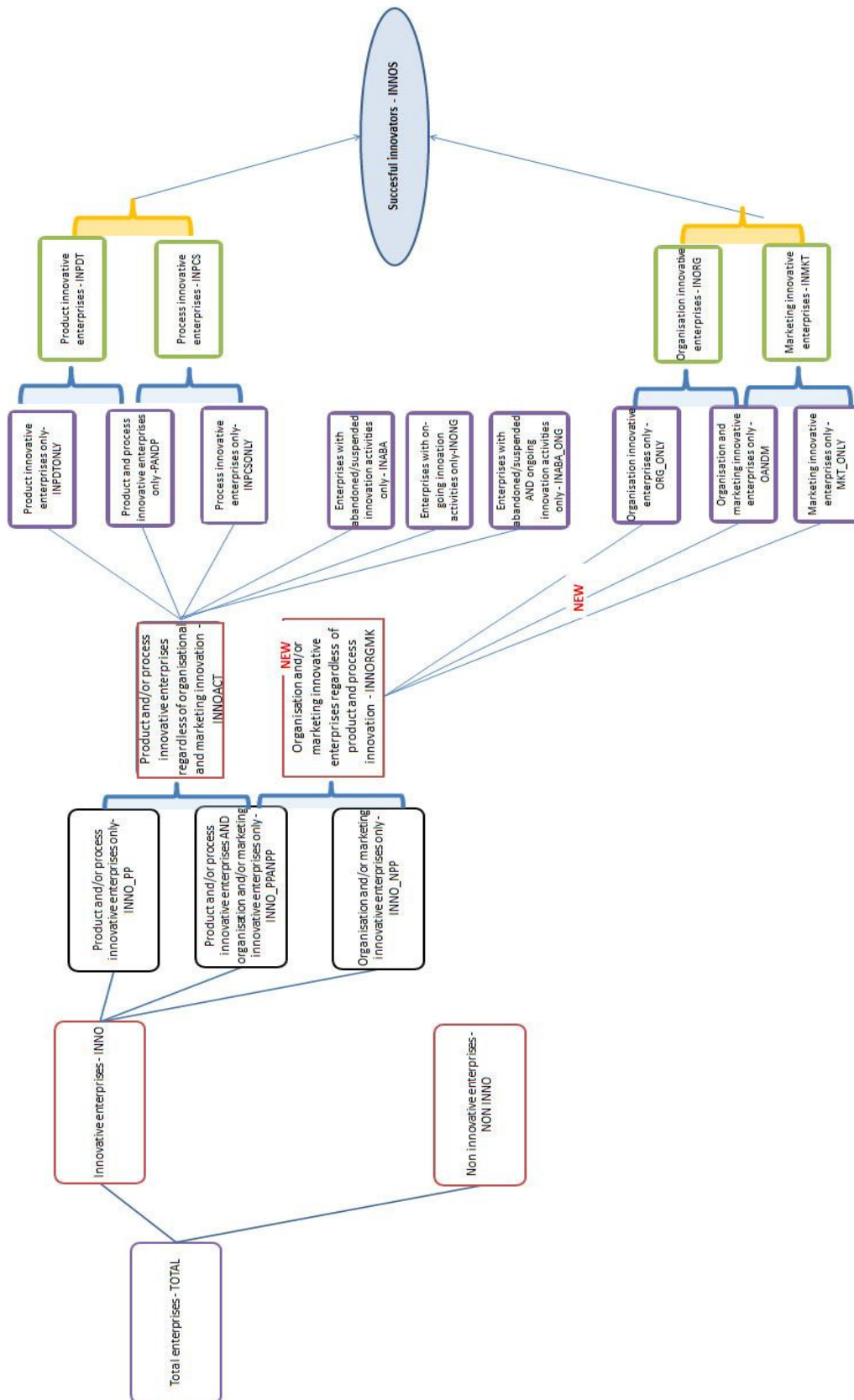
- undertaking process or marketing innovation
- undertaking (or combining) multiple innovation activities

This raises a key question of whether Scotland's dependence on organisational innovation is a weakness. Further research is planned to assess whether there is a relationship between types of innovation activity and business performance, for example in terms of turnover growth and productivity. This will also consider whether there are optimal combinations of innovation activity.

## Conclusions

Scotland's overall performance of innovation active business improved significantly between 2010-12 and 2012-14, compared to other CIS European countries. This was due to improved performance in each of the main types of innovation activity. However, it is clear that Scotland's innovation performance is driven mainly by organisational innovation rather than by businesses introducing new products, services or processes. And Scottish businesses are less likely to engage in multiple innovation activities than those in other countries. Further research is required to assess whether this is an 'innovation weakness' compared to other countries in terms of business performance and growth.

## Appendix A: Types of Innovators Overview



Source: Eurostat Metadata