

'Scotland's Economic Future: Disruptive Ideas' is a paper series conceived and coordinated by Alison Hunter and Fabian Zuleeg. Together with a group of economic experts, policy analysts and commentators from Scotland and beyond, the papers have been developed entirely on a voluntary basis. Each paper presents the views of the individual writer concerning Scotland's economic future at a time of significant global and domestic change and uncertainty. While covering a wide range of topics from institutional reform to immigration, the papers share a vision for Scotland to make greater strides towards a resilient, economic future.

The papers aspire to the following aims:

- 1) To generate a fresh, apolitical and inclusive debate concerning Scotland's economic future
- 2) To support the process of new / revised policy adoption and new 'ways of working' which can be injected into Scottish life and society, with the aim of generating a better future for all of Scotland's citizens
- 3) To focus – at least initially – on a core set of themes linked to Scotland's economic development and to inject 'disruptive' thinking into the debate

Please see the accompanying concept note for a more detailed outline of the objectives and vision for this paper series. We hope that you will find our content interesting, thought-provoking and worthy of wider discussion across Scottish society, such that the significant efforts from our contributors might be seen in future change and action across related economic policy fields. Please do not hesitate to get in touch with the individual contributors or the paper series coordinators if you wish to discuss further. And please do share with colleagues.

Thank you for your time.

**Alison Hunter and Fabian Zuleeg**

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### A Statistical Test of Independence by Richard Marsh

Richard Marsh is an economist specialising in regional economics and economic statistics. He is a member of two Scottish Government expert groups on economic statistics and economic modelling. Richard contributed to the Sustainable Growth Commission, working on the economic value of migration.

#### Introduction

This paper considers the current system of statistics in Scotland and provides a number of options and recommendations that would improve it.. Beyond the technical benefits this would offer, there is also significant scope to improve Scotland's approach to economic policy development and evaluation. At the core of this paper, a case is made for an independent Scottish Statistics Agency, led by a Chief Statistician.

The UK system of producing statistics was designed to produce economic statistics for the whole of the UK, not for the devolved administrations. Since devolution there has been an increase in the demand for statistical evidence of Scotland's performance across a wide range of areas. This has exposed gaps in the availability of data, with responses which seek to 'patch' these gaps rather than to take a more expansive view of Scotland's future needs. Indeed, if Scotland's statistical system were to be designed from scratch it would almost certainly look very different.

The Bean Review (Bean, 2016) invited a fundamental rethink about the way we produce economic statistics. The Digital Economy Act (2017)<sup>1</sup> has improved access to a range of economic statistics collected by Her Majesty's Revenue and Customs (HMRC).

Without a fundamental change in the way we produce data in Scotland we are likely to find ourselves reheating old data to try to answer new policy questions. The creation of the Scottish Fiscal Commission<sup>2</sup> demonstrates that it is possible to establish an arms-length scrutiny body to produce economic statistics. There are lessons to be learned, here, in how Scotland takes forward its approach to data.

Scotland needs to establish an independent Scottish Statistics Agency that is imaginative, agile, forward looking and customer focused. A review should be undertaken reflecting Scotland's statistical needs and informing economic policy. Capacity will need to be built across Scotland's statistics community, responding to the significant potential offered through the Digital Economy Act (2017).

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<sup>1</sup> Digital Economy Act 2017 - <http://www.legislation.gov.uk/ukpga/2017/30/contents/enacted>

<sup>2</sup> The Scottish Fiscal Commission - <https://www.fiscalcommission.scot/>

The Agency should be led by a Chief Statistician in Scotland who should be independent of the government of the day and free to interpret the data needed to support and measure government policy. Countries similar to Scotland operate independent statistics agencies and have already achieved much of Scotland's stated vision of data leadership. Establishing an independent statistics agency would signal a much-needed step-change in the provision of statistical support for the evaluation of Scotland's public policy choices and the delivery of public services.

### Challenges and Opportunities

Measuring Scotland's modern economy has become more challenging. While more data has become available the economy has become increasingly complex, evolving at an ever-quicker pace. In the early eighties Scottish manufacturing accounted for more than one in four jobs including shipbuilding, steel and whisky<sup>3</sup>. Today manufacturing accounts for just one in every fourteen jobs in Scotland and the latest official classification system added over one hundred industry classifications in just five years<sup>4</sup>.

Rapid technological changes have raised challenges in defining and measuring economic activity. These are compounded by Scotland being a small, devolved and open economy. Scottish companies account for less than half the turnover of Scotland's private sector (Scottish Government, 2019) while foreign owned companies (outside the UK) accounted for nearly £100 billion of turnover in Scotland<sup>5</sup>.

The pace of devolution is beginning to expose cracks in the UK's system of producing economic statistics, bearing in mind that its original purpose was not to serve devolved administrations. This places a strain on the ability of statistical systems to measure key indicators like economic growth, income, capital investment and exports. For example, some key indicators provide limited detail for Scotland's economy, while systems struggle to separately identify activities within different parts of the UK.

Furthermore, governments are increasingly interested in goals beyond raising economic growth and increasing national income. Broader strategies encompassing social and environmental outcomes require more detailed economic data.

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<sup>3</sup> Based on employment in 1981 (Census of Employment, Office for National Statistics).

<sup>4</sup> The Standard Industrial Classification (SIC) published by the Office for National Statistics (ONS) expanded from 514 industry classes in SIC 2002 to 615 in SIC 2007, including new industry classes previously considered subclasses of other industries (e.g. data and technology activities).

<sup>5</sup> The latest Businesses in Scotland report (Scottish Government, 2019) focuses on private sector businesses (excluding some financial services). Businesses based abroad (outside of the UK) accounted for £95.6 billion of turnover in 2019.

Scotland's Economic Strategy sets out the Scottish Government's vision for Scotland's economy and society (Scottish Government, 2015). Promoting economic growth and reducing inequalities is the strategy's central theme. Inclusive growth was set out as one of the strategy's four pillars<sup>6</sup>. When the strategy was first published nearly five years ago it lacked a clear definition of what constitutes inclusive growth and how it could be measured; both in terms of the activities contributing towards this aim and the changes to demonstrate success.

The Scottish Government's Council of Economic Advisors<sup>7</sup> (Scottish Government, 2018) set out how to define and monitor inclusive growth for Scotland. The Council's review listed a set of components (to be taken together) including productivity, population, participation, people and place.

The difficulties in applying inclusive growth to Scotland's key economic development initiatives were highlighted in a recent inquiry into City Region Deals. The inquiry found that "the partners behind the Edinburgh and South-East Scotland City Region (ESESCR) Deal said that clarity was lacking from the UK and Scottish governments on the exact definition of economic growth to be used to model and assess projects" (Scottish Parliament, 2018). The absence of a clear definition also creates a gap in understanding what should be measured and how this data can be derived and applied.

Scotland has not had a broad conversation about the statistical system and evidence base that it needs. Instead we have continually asked how minor improvements can be made to existing systems and the data they produce. This incrementalism is unlikely to promote the step-change required in how Scotland values and uses economic data.

The Scottish Parliament's inquiry into economic data (Scottish Parliament, 2018) concluded "*It is clear that were we starting from scratch with a plan to configure Scottish economic statistics we would not seek to replicate the current statistical framework and scale of operation at the UK level.*"

For example, recent developments to improve or expand economic statistics in Scotland have often relied on UK-wide data. This includes measures of labour productivity and GNI (both available online). Consistency with the core economic data of the UK (and other countries) is desirable but it is not sufficient for the purpose of building a statistics system. At best Scotland will only be able to replicate some of the statistics produced for the UK, but even this may not be the best use of resources to help scrutinise public policy.

The Scottish Government produces economic statistics covering most of the key indicators used to scrutinise modern economies. Scotland is by far the best served part of the UK in terms of economic statistics and the only UK devolved administration to produce quarterly GDP figures (Marsh, 2017).

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<sup>6</sup> The four pillars of Scotland's Economic Strategy are investment, innovation, internationalisation and inclusive growth

<sup>7</sup> The Council of Economic Advisors - <https://www.gov.scot/groups/council-of-economic-advisers/>

The Bean Review (Bean, 2016) invites a fundamental rethink about the way we produce economic statistics. For example, it is plausible that it would be more appropriate to measure Green GDP for Scotland.

It is important that Scotland takes up the challenge laid down by the Bean Review and looks at new approaches to develop the next generation of economic statistics. This is particularly true when considering the need to blend economic data with wider environmental and social outcomes to measure the effectiveness of public policy choices.

The Scottish Government's Data Delivery Group currently falls short of this aim. The creation of the Scottish Fiscal Commission demonstrates how it is possible to establish an arms-length scrutiny body to produce economic statistics. The Commission was established relatively quickly at minimal cost and has served to significantly increase the scrutiny of government spending and public policy choices. This model could be replicated for Scotland's statistics agenda.

Without fundamental change in the way we produce data in Scotland, we may find ourselves reheating old data to try to answer new policy questions. Indeed, the Scottish Parliament's economy committee raised the issue of a precipitous fall in the number of formal evaluations of economic development initiatives (Scottish Parliament, 2019). While there is no evidence of a cause / effect relationship between the absence of evaluations and an absence of data, there is a strong likelihood that the reduction in evaluation work is influenced by a lack of relevant data, which is sufficiently granular.

The Digital Economy Act (2017) will provide the Office for National Statistics with improved access to a range of economic statistics collected by Her Majesty's Revenue and Customs (HMRC) covering employment, wages, profits and exports. The Scottish Parliament's economy committee has said "*... it is imperative that the Scottish Government fully benefits from this easier access to administrative data.*"

The vast reservoir of microdata available is an underused resource and cries out for the kind of change in culture advocated by the Bean Review. The Bean Review calls for statisticians to turn their attention away from 'getting the statistics out' and think more creatively about potentially new series of data more relevant to economic policy. This could significantly improve both policy making and policy evaluation.

### **The impact of change**

#### *Creating Added Value*

At first glance the introduction of an independent statistics agency could barely be described as a disruptive idea. However, a recent inquiry into economic data (Scottish Parliament, 2018) drew particular attention to the need for agility in measuring Scotland's changing economy, making more use of new data sources, strengthening governance and the need for robust and independent analysis of Scotland's data needs.

Professor Graeme Roy's recent Sir Alexander Stone Lecture (Roy, 2019) considered the challenges facing both Scotland and the UK after Brexit. The lecture touched upon a need to strengthen existing structures and that *"... a mistake has been to leave the majority of analysis and evidence to the Scottish and UK governments."*

The lecture addressed the possibility of creating a new independent body, in the context of Scotland's constitutional position, with the sole purpose of providing facts, figures and information. The body would also highlight any gaps in the information needed to inform decision-making.

Independent bodies already play a vital role in assessing evidence and producing information to help inform public policy choices in Scotland including the Office for Budget Responsibility (OBR)<sup>8</sup>, Scottish Fiscal Commission (SFC), Audit Scotland<sup>9</sup> and the UK Statistics Authority<sup>10</sup>. All of these independent bodies have been created since devolution. An independent statistics agency would add significant value to the overall stock of Scotland's data system and could play a clear role in connecting how the constituent parts of this system work better together.

In September last year the Scottish Parliament voted to introduce a new committee bill<sup>11</sup> to restrict pre-release access<sup>12</sup> to key economic statistics in Scotland. The proposed legislation is a modest but important first step in securing more independence for economic statistics. But it falls somewhat short of the wider cultural change that would be brought about with the introduction of a fully independent statistics agency for Scotland.

### *Asking the right questions*

The Bean Review provided the following assessment of the ONS's approach to economic statistics:

*"Ideally, staff would have time to invest in exploring the consequences of changes in the economy for economic measurement and for investigating the use of alternative data sources. However, time constraints and a complex and fragmented technology estate have limited the extent to which this is possible. Instead, staff are overwhelmingly focussed on simply 'getting the statistics out'. Relatively little attention is devoted to how the quality and relevance of the statistics, or their delivery, could be improved."*

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<sup>8</sup> The Office for Budget Responsibility (OBR) - <https://obr.uk/>

<sup>9</sup> Audit Scotland - <https://www.audit-scotland.gov.uk/>

<sup>10</sup> The UK Statistics Authority - <https://www.statisticsauthority.gov.uk/>

<sup>11</sup> Scottish Parliament (19 September 2019) motion S5M-18727 was passed, proposing a Committee Bill to restrict pre-release access to economic statistics - <http://www.parliament.scot/parliamentarybusiness/report.aspx?r=12260&i=110827>

<sup>12</sup> The UK Statistics Authority review (2010) of pre-release access defined this as "the practice of making official statistics, and the written commentary that accompanies them, available in advance of their publication to specific individuals not involved in their production. In most cases this includes Government Ministers and their advisers."

The Review invites a fundamental rethink about the way we produce economic statistics, the structure of our economic statistics system and how they are presented. Echoing the Scottish Government's focus on inclusive economic growth the First Minister suggested earlier this year that health and wellbeing were as fundamental as GDP<sup>13</sup>. There is, therefore, a clear need to support this vision with relevant and reliable data.

It is, equally, entirely plausible that it would be more appropriate to measure GDP taking into account the consumption of natural resources. The ONS publishes environmental accounts (available online) which include indicators combining GDP and data on energy and material consumption. The ONS is also considering how to measure the UK's circular economy. Scotland, too, needs to keep pace with this agenda, reflecting the Scottish Government's commitment to addressing climate change through a wide range of measures. The role of data here could signal a game-changer in how Scotland moves forward with this agenda.

Additionally, the Scottish Government has arguably produced some of its most policy relevant information when it has produced publications that don't seek to copy an existing UK publication or statistics. For example, in the Scottish Government's annual carbon assessment of the Scottish draft budget (Scottish Government, 2018). The Scottish Government has a long-standing programme producing annual analytical Input-Output tables to support economic modelling (UK analytical tables have been produced less frequently).

Establishing an independent statistics agency would provide a platform to generate statistics that best support the evaluation of Scotland's public policy choices and the delivery of public services.

### *Policy based evidence*

Evidence-based policy should start with a focus on the policy choices facing Scotland, the key questions about the delivery of public services and what information is needed for meaningful monitoring and evaluation. Currently there is a tendency to sift through administrative information and long-standing surveys and ask to which policy questions they could be applied.

While the call for evidence-based policy making has been persistent since devolution, too often we end up with policy-based evidence. Without full consideration of how data is produced to inform and evaluate public policy it is likely that key policy choices will continue to go unmeasured with a poor sense of progress or direction. For example, a review of Scotland's £5.2 billion city deals (Audit Scotland, 2020) found that the Scottish Government does not have a plan to measure their success.

Additionally, a data deficit can incentivise a rather limited approach to policy making, where the status quo offers the least risky response in a context of limited evidence of different policy options and outcomes.

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<sup>13</sup> More information is available at <https://www.gov.scot/news/health-and-wellbeing-as-fundamental-as-gdp/>

Promoting growth and reducing inequality are the “central themes” of Scotland’s Economic Strategy. The Scottish Centre for Regional Inclusive Growth<sup>14</sup> (SCRIG) published a diagnostics tool at the end of last year<sup>15</sup> showing inclusive growth outcomes for local authority areas and their position relative to the Scottish average. The tool draws on a range of data sources<sup>16</sup> that appear to have been available before the latest economic strategy shifted focus to inclusive growth in 2015.

Measures of inclusive growth outcomes include the value of exports, number of businesses, migration and wages. This represents a trawl through existing data reheated and repackaged online to try to address new policy questions. It is an example of applying old data to new policy questions rather than exploring what new data would be needed to meaningfully evaluate public policy.

### **The need for cultural change across the Scottish statistics landscape**

#### *Culture versus process*

A breadth of microdata is available and has been (to date) an underused resource. A proactive approach from an independent statistics agency could help local authorities, development agencies, Audit Scotland and the Scottish Government make data-linkage (using administrative data) the standard approach for measuring the impact of economic development policies.

Most independent inquiry covering the state of economic statistics in Scotland has called for an approach that is more imaginative, creative, agile, forward looking and customer focused. This will not be delivered by changing processes but by changing culture to become more forward looking and focused on Scotland’s data needs. This will only be fully realised when Scotland’s statistics system is independent of the government of the day.

#### *Scrutiny without evidence*

The Scottish Government is different from the ONS in that it is both a producer and consumer of official statistics. When publishing a review of pre-release access to statistics (UK Statistics Authority, 2010) the UK Statistics Authority provided an assessment of conflicts that may arise:

*“Statisticians working in government departments are alert to the way in which their work is regarded by their managers and Ministers. The respect of their departmental colleagues, their pay, promotion prospects and future career can be affected by the perception of their contribution to the work of the department.*

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<sup>14</sup> Scotland’s Centre for Regional Inclusive Growth (SCRIG) - <https://www.inclusivegrowth.scot/about-us/>

<sup>15</sup> The diagnostics tool - <https://scotland.shinyapps.io/sg-scrig-dashboard/>. The accompanying Inclusive Growth Outcomes Framework (published December 2019) - <https://www.inclusivegrowth.scot/resources/data-and-analysis/2018/06/inclusive-growth-diagnostics/>

<sup>16</sup> Data sources include the Scottish Index of Multiple Deprivation (SIMD), Scottish Household Survey, Scottish Housing Conditions Survey, Annual Population Survey, Annual Survey of Hours and Earnings, demography data from the National Records of Scotland and secondary data from the ONS on businesses and the economy.

*Circulation of that work, prior to publication, may serve to focus the statisticians' attention not on the public utility of their advice but rather on how it will be received within the department. If, for example, a government department is defending a controversial policy position, this may give rise to an imperative within the department for all officials to 'pull together', both to achieve as much as possible and, in the meantime, present the best possible outward face. In such an environment, departmental statisticians who present evidence that is seen as unhelpful run the risk of being perceived by departmental colleagues as naive or disloyal."*

Statisticians should not be concerned about how their work will be received by government departments or ministers. Statisticians should operate within a system which prioritises the development of our statistical systems, engages with stakeholders, uses digital data and online systems more creatively and provides innovative solutions in linking disparate sets of information.

Data will become increasingly important for the effective delivery of public services in Scotland. This needs a cultural step change to adopt a different mindset for how we value public data and statistics and implies a significant programme of support for statisticians and public agents who work with statistics, to lead this effort.

### **Overcoming barriers**

The bottlenecks and barriers to addressing the challenges are predominantly political. Opposition parties often call for greater transparency and independence across a range of issues but then strike a more cautious tone when in government.

A persistent line of argument relating to the Scottish statistics debate argues that many of the desired outcomes from statistical independence could be achieved either through the status quo or incremental change. Indeed, Scottish Government statistics currently follow the UK Statistics Authority Code of Practice for Statistics<sup>17</sup> However, this overlooks the opportunity cost of incrementalism where more innovative approaches to data gathering and analysis impact upon the overall value of data, not least in the role it plays in robust policy evaluation and policy development.

The Code of Practice includes the trustworthiness, value and quality of statistics produced. It sets out that statistics should be clear, publicly available and published to schedule with revisions explained. These standards remain crucial and Scotland's future efforts to meet them will be greatly assisted by the proposed committee bill on economic data (pre-release access).

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<sup>17</sup> More information about the Code of Practice for Statistics is available at <https://www.statisticsauthority.gov.uk/code-of-practice/>

As Scotland rises to the challenge of engaging in more ambitious policy areas (such as climate change mitigation, technological transition, well-being and inclusive economic growth) we require to frame and act on these areas from a better-informed perspective of both our performance and our goals. Taking a global leadership stance in these highly complex areas will require nothing less.

The Scottish Parliament inquiry into economic data (Scottish Parliament, 2018) highlighted potential 'advantages' for the Scottish Government as both a user and producer of national statistics. This includes the ability to publish economic statistics without prior notice, the ability to withdraw or delay some economic data publications. Therefore, the inquiry highlighted a potentially strong risk of data being used in a partial way.

However, the perception of an advantage for the government of the day is misplaced. The Scottish Government is as likely to benefit from an independent statistics agency as those seeking to hold the government to account. During the 2014 Scottish independence referendum the UK Government published a series of research reports as part of a Scotland analysis programme (Treasury, 2014).

The Scottish analysis programme explored how independence would impact the economy, businesses, jobs and public services. The analysis was supported by statistics and economic modelling and was contested by many economists. Scrutiny of the UK government's analysis would be significantly strengthened by the more prominent voice of an independent Chief Statistician and an independent Scottish Statistics Agency.

An additional argument can be made here: by having an independent agency, questions of timing and availability of data are no longer subject to accusations of narrow political gain.

### **Recommendations**

#### *Creating a statistics system owned by the Scottish statistics community*

Recalling that the UK system of producing statistics was designed to produce economic statistics for the whole of the UK, and not for the devolved administrations, it is clear that the pace of devolution has exposed flaws in the application of the UK system to producing economic statistics in Scotland.

Currently compared to ONS statisticians, Scottish Government statisticians tend to operate in a way which could be described as opportunistic, but relatively powerless, statistical scavengers. This is not to underplay the dedication of the profession, but rather to expose the constraints under which they operate.

Policy makers and those involved in economic development need to engage in the development of an independent statistics system for Scotland. The wholesale change emanating from an independent statistics agency would *inter alia* support local authorities, development agencies, Audit Scotland and the Scottish Government.

Cultural change will need to be supported by a wider step-change in the way economic data is used to inform and shape public policy. This will include a programme of support and capacity building for statisticians and others who work with statistics in Scotland.

Those involved in economic development and the delivery of public services have been asked to make better use of available data. But the pace of change is rapid and this has made it more challenging for many organisations to invest the time needed to develop the know-how to exploit new sources of data.

To start answering these challenges, Scotland's Chief Statistician needs to be made independent from the Scottish Government. Furthermore, an independent Scottish Statistics Agency should be established. Independent leadership will help to usher in the wider cultural change needed. This is particularly pressing given the need to establish a global competitive edge in the innovative use of data and the opportunities afforded by the Digital Economy Act (2017).

A Scottish Statistics Agency that is imaginative, creative, agile, forward looking and customer focused would be able to make data-linkage (using administrative data) the standard approach for measuring the impact of economic development policies. This should also include the delivery of wider public services, given the need to 'widen the net' of data analysis beyond core economic data when assessing the overall performance of Scotland's economy.

Northern Ireland, through the Northern Ireland Statistics and Research Agency ([NISRA](#)), has more flexibility and power to produce economic statistics. Whilst Scotland remains the most advanced devolved administration in terms of economic statistics, Northern Ireland is making significant advances and is developing a similar set of economic accounts.

Economies with a similar population to Scotland operate independent statistics agencies and have already achieved much of Scotland's stated vision of data leadership. For example, Stats New Zealand is a government department, but operates independently of government. The Stats New Zealand Chief Executive also acts at the Government Chief Data Steward (GCDS) to enable a joined-up approach across government.

The economic statistics published by the Scottish Government tend to pick out relevant data from UK wide surveys and administrative data. This approach needs to change if Scotland is to generate a more reliable, relevant and holistic evidence base of its performance from which to base its future economic vision and objectives.

Before a statistics agency is created, a review should be set up detailing the comprehensive data needs of development agencies, local authorities, development agencies, Audit Scotland and Directorates within the Scottish Government itself. This would help inform a plan to build an economic statistics system that reflects the needs of Scotland.

This would set an ambitious task for Scotland's statisticians to fully explore the potential offered through the Digital Economy Act (2017). For example, linking administrative data from HMRC and Revenue Scotland may shine a light on previously hard to measure areas like the extent and impact of zero hours contracts or the short-term residential lets industry.

Establishing an independent statistics agency does not mean the withdrawal or concentration of statisticians. Resources can still be embedded across a range of agencies and Scottish Government directorates.

The agency should be led by Scotland's Chief Statistician who should be independent of the government of the day and free to interpret the data needed to support (and measure) government policy and comment about the use and misuse of data in public debate.

Regardless of Scotland's future constitutional status, having an independent Scottish Statistics Agency and Chief Statistician, would inform and improve the quality of public debate. This would provide the necessary foundations for evidence-based policy making in Scotland.

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