

This is an Open Access document downloaded from ORCA, Cardiff University's institutional repository: <https://orca.cardiff.ac.uk/id/eprint/117211/>

This is the author's version of a work that was submitted to / accepted for publication.

Citation for final published version:

Crawley, Andrew, Munday, Max and Roberts, Annette 2018. How serious is a devolved data deficit? A Welsh perspective. *Local Economy* 33 (8) , pp. 862-876. 10.1177/0269094218820286

Publishers page: <http://dx.doi.org/10.1177/0269094218820286>

Please note:

Changes made as a result of publishing processes such as copy-editing, formatting and page numbers may not be reflected in this version. For the definitive version of this publication, please refer to the published source. You are advised to consult the publisher's version if you wish to cite this paper.

This version is being made available in accordance with publisher policies. See <http://orca.cf.ac.uk/policies.html> for usage policies. Copyright and moral rights for publications made available in ORCA are retained by the copyright holders.



## **How serious is a Devolved Data Deficit? A Welsh perspective**

Andrew Crawley

School of Economics, University of Maine USA. [andrew.crawley@maine.edu](mailto:andrew.crawley@maine.edu)

Max Munday and Annette Roberts

Cardiff Business School, Colum Drive, Cardiff University, CF10 3EU, UK.

[mundaymc@cf.ac.uk](mailto:mundaymc@cf.ac.uk); [robertsa1@cf.ac.uk](mailto:robertsa1@cf.ac.uk)

### **Abstract**

Over the last decade the UK has seen greater fiscal devolution with both Wales and Scotland gaining additional powers. However, to date, such devolution has not been sufficiently accompanied by an increase in the production of more local economic data to assist policy making choices. The paper considers this issue by first exploring, in general, the availability of local economic data with a focus on Input-Output tables and trade statistics. The case of Wales is then used to explore the problems associated with the lack of local economic data. The paper suggests that not providing the means to assess how fiscal policy might impact economic performance could present a particularly serious challenge for devolved governments. The conclusions discuss how a devolved data deficit might be overcome in a cost effective manner.

### **Key words:**

Economic intelligence; Devolved regions; Fiscal autonomy; Trade data; Regional economic models

## **Introduction**

The governmental structure of the UK has changed dramatically in the last two decades as a result of greater powers being devolved to Scotland, Wales and Northern Ireland. In addition, there is now a developing focus around city regions, and meso-regional structures such as the Northern Powerhouse (Gray et al., 2018; Lee, 2017). With more decentralised decision-making comes different data demands, and indeed requirements for data at different geographical scales. This paper discusses whether differences in the quantity and quality of economic data (and then the related economic modelling capabilities and possibilities) could create problems for devolved administrations and city regions in terms of achieving quality economic policymaking, monitoring and evaluation. The focus is on the importance of developing more local economic data in an increasingly devolved fiscal context, and on inadequate tools with which to understand the impacts of changes arising from global macroeconomic shocks, as well as the evolution of a more ‘devolved’ tax system. Whilst data problems are a well-known and commonly cited limitation of sub-national analysis in the UK and elsewhere, this paper fills a gap in the literature by focusing specifically on such data gaps and some possible solutions.

The Welsh economy provides the case example for this paper, but the findings are applicable for most fiscally devolved/devolving nations. Wales is a particularly useful study lens through which to explore the causes and consequences of a ‘devolved data deficit’, especially how this relates to supporting policy on tax levels and application. Wales has evolving autonomy over some taxes, but with a paucity of economic data and economic modelling capacity to help evaluate the implications of fiscal change.

The first section of the paper provides the background to regional economic data, first in general terms, but then more specifically within the UK. The paper then introduces the case of Wales focusing on changes brought about from the devolution of fiscal powers, and emerging data requirements. The final section draws some conclusions on the issues arising from the devolved data deficit, and hints at possible solutions.

## **Background and context**

Developing high quality economic and fiscal policy is integral to the functions of government. In developing and changing existing policy, insight into the expected consequences of interventions is essential. High quality economic information provides a route to measuring the

growth of the economy, and then to the monitoring and evaluation, and the subsequent refinement of policy tools.

For these reasons economic data collection is not just important, but typically mandated through law in most developed nations. Membership of bodies such as the International Monetary Fund (IMF), the Organisation for Economic Cooperation and Development (OECD) or the European Union requires regular filing of economic data, including systematic national accounts. It is taken for granted that quality economic intelligence aids policy development. Stock and Watson (2002) together with Bernanke and Boivin (2003) demonstrate that more detailed and quality economic information improves forecast accuracy, which in turn directly impacts on policy. Indeed Gelman et al. (2014) argue for even more wide-ranging economic data and justify this call on the basis of improved intervention.

#### *Access to Regional Data*

There is a growing need to collect data that reveals the heterogeneous nature of regional economies. This issue has come to the forefront in recent times particularly in the context of establishing some of the expected regional effects of Brexit, and in examining the regional consequences of the 2007-2008 financial crisis (see for example Bristow and Healey, 2015). While regional level economic data can be extremely valuable for policymakers and other stakeholders, the extent to which it is available compared to national economic data varies considerably. A regional economy, like a national economy, may be seen as the sum of transactions of the agents within its boundaries (Hoover, 1975). Importantly, at a regional level these transactions are often not confined within political or census boundaries. Aggregate data from official statistical agencies such as for unemployment and output are available in most developed nations at a regional level. However more detailed sectoral information or trade data is not so readily obtainable. This type of data can provide regional governments and private industries with greater economic intelligence on where investments could be made, how economies are braced for economic shocks and a better understanding of capital movements.

One of the primary regional data sources that allows these sorts of insights are Input-Output (IO) tables and associated regional trade flow data. When assessing regional IO data for different countries one noticeable feature is the significant variation in the quality of tables produced (see Ploszaj et al., 2015; Jensen et al., 2017, for a detailed survey of regional IO which is beyond the scope of this paper). However, Miller and Blair (2009) note the need for

regional IO tables due to differences in the structure of production across space and between the sizes of economic areas. Firstly, the structure of the economy in a particular region may or may not be similar to the structure of the national economy. For this reason, regional IO models allow different sectoral disaggregations to be utilized. Secondly, the size of the economic area has implications for the interdependence of an economy. Large economies tend to have less interdependence than other regions in terms of sales “exports”. Whereas smaller regions are likely to be more import intensive, and are therefore much more intertwined with external economies and subject to many more exogenous shocks. Regional trade flow data is generally much less available, although there is considerable interest in regional inward investment flows (see for example the work of Sethi et al., 2003; Villaverde and Maza, 2015; Crawley et al., 2012). For selected regions, flows of inward investment present the opportunity for new capital bringing much needed growth and development. Being able to understand these trade and investment flows and to trace their origins, as well as having details on the amounts and sectors involved, allows policy makers to begin to understand the determinants of inward investment, and then to better target resources on attracting such capital. In addition more local trade data allows a better understanding of the likely regional vulnerability to trade shocks. To date access to this information is very limited. The data can be commercially sensitive, but part of the problem has been the spatial units at which information has been collected. Aggregate data is often broken down by region but it does not contain important sectoral information. It is possible to gain some level of knowledge on trade flows through regularly updated IO tables (see the work of Boero et al., 2018, in the case of the USA) but as discussed above these are also limited regionally.

The paper thus far has considered the need for regional trade and IO data, but has not addressed national practices. Studies such as Ploszaj et al. (2015) have conducted systematic reviews of regions with access to IO tables, but the focus is on ad hoc academic studies rather than officially produced IO tables. Ad hoc studies can be useful but consistent official IO tables provide comparable data that meets international standards of best practice, as well as fitting into aggregate national accounts, (Miller and Blair, 2009). Table 1 presents an outline survey of 10 selected large economies and assesses whether they have official government constructed regional IO tables. One noticeable feature of Table 1 is the lack of official regional tables for most of Europe. Eurostat keeps detailed country level tables but this does

not expand to regions within those countries.<sup>1</sup> Both Brazil and China appear ahead of their European counterparts in maintaining some form of regional tables. In total, 6 of the 10 countries considered do not maintain regional IO data. The US appears to have more developed production of, and access to, regional economic data, although this conclusion might be contested. Over the decades, US regional data requirements have led to private organizations such as IMPLAN and REMI<sup>2</sup> providing at cost regional IO models, which is additional to federally produced state tables. One driving force here are requirements in selected States (and at Federal level) for projects, such as those involving public health and welfare, to produce economic impact assessments.

*Table 1 about here*

### *Background to Regional Data in the UK*

The devolution process in the UK has had slightly differentiated trajectories in Wales, Scotland and Northern Ireland, and with further impetus to decentralisation trends provided by the establishment of city-regions, culminating in the *Cities and Local Government Devolution Act* (2016). These processes have been subject to much academic and policy debate. This has included discussion of the rationale for, and development of, the different geographies of governance (for example, Harrison, 2012; Lee, 2017), and their potential implications (including for example Pike et al., 2010; McGregor and Swales, 2005). However, an important element of the UK localism agenda since 1997 is a focus on increasing regional accountability (McVittie and Swales, 2007). Indeed a consequence of the evolving decentralisation process, and new governance structures, is that more scrutiny is being applied to the ability of the devolved administrations to respond to the challenge of greater decision-making authority, particularly in relation to fiscal devolution. This challenge needs to be understood in terms of data, institutional capacity and skills. For example, McGregor and Swales (2005) commented that there was:

*“Some doubt about whether the coverage, quality and timeliness of existing regional data provision are sufficient to support decentralized decision-making (or to facilitate the efficient conduct of any national regional policy). Whilst the Allsopp (2004) Review seems likely to*

---

<sup>1</sup> For more details see <http://ec.europa.eu/eurostat/web/esa-supply-use-input-tables/methodology/symmetric-input-output-tables>

<sup>2</sup> For more details on IMPLAN see <http://www.implan.com>, for more details on REMI see <https://www.remi.com>

*stimulate improvements, information vital for a secure understanding of the regional economy will still be missing” (p. 488).*

This conclusion would still appear to be relevant. The *Allsopp Review* (2004) recommended improvements to sub-national economic statistics, examining the data requirements to support overall UK regional policy, and some of these recommendations have been implemented. However, the *Allsopp Review* was criticised, with, for example, McVittie and Swales (2007) showing that the focus was overmuch on ‘English’ regional policy, and that for devolved regions there was a need for more understanding of how their regional economies operated. In this respect it was argued that there was inadequate attention given in the *Allsopp Review* to regional requirements for trade data, and regional price indices. There has been very limited progress on either of these fronts. The Silk Commission (2014) showed that in a devolved context there remained considerable scope to improve the availability of economic data, to inform debates, particularly with respect to the changing fiscal landscape. Then while the needs of user communities, particularly within the three devolved administrations have increased over time, there are serious questions concerning differences in the quality of economic data across these administrations, and sub-regional geographies, including the evolving City regions. In this latter respect Crawley and Munday (2017) question the availability of data for determining the sectoral approaches that have been part of the City-region debate. Their work presented a series of methods that could be used to identify ‘key’ sectors, one of which included the use of IO data. The authors stressed the importance of this data in understanding the characteristics of key sectors. Linked concerns were also aired in the most recent review of UK economic statistics. Bean (2016) in the *Independent Review of UK Economic Statistics*, recommended improvements to the timeliness and granularity of economic data by location. Bean also showed that concerns on sub national statistics were a recurring theme in the review:

*“A frequent issue raised in consultation with users was the need for timelier and more detailed statistics at a finer level of geographical disaggregation;” and:*

*“The lack of information to diagnose the specific economic challenges facing geographic units below the level of the UK as a whole represents a handicap for policy and business decisions.”* (p. 47).

Bean focused in part on issues around the structure and timeliness of regional gross value added

(GVA) estimates, observing that a top down approach to regional estimation of GVA was unlikely to yield reliable estimates for small areas, but that any attempt to develop estimates from the bottom up were likely to be hindered by small sample sizes. Overshadowing these comments were the cost implications for the ONS and survey respondents of improving the quality of GVA estimates. Henry Overman quoted in the *Bean Review* concluded that poor timeliness of regional GVA estimates:

*“Makes getting a picture of the current performance of city and other economies very difficult.”*  
(p.48)

Unfortunately growing concerns on the quality and timeliness of regional economic statistics have occurred during a period when UK government spending on statistical data collection and analysis has fallen. The UK Statistical Authority Business Plan for 2016/17 to 2019/20 emphasises that there will be a 19% real terms reduction to core funding in the period to 2019/20, and with staffing levels falling. This affects services offered by the Office for National Statistics (ONS). Although the ONS is not the only provider of economic statistical information, it is the main provider. Indeed, the UK Statistical Authority has voiced concerns about how recent budget cuts impact on its ability to deliver and improve outputs to meet public needs (Dilnot, 2015). Moreover, recent demands for increasing regional data have gone hand in hand with strong competing pressures on the ONS, including requirements to improve measurements of output and productivity in the more diverse digital economy, and with the UK seen as lagging other advanced economies in its exploitation of administrative data (see Bean, 2016, and also Fenton, 2016, for planned developments at the ONS to provide further information for devolved economy policy making).

In consequence while the decentralisation of decision-making and a localisation agenda have been pursued by the UK government, devolved administrations, and groups of public bodies and others brought together through city-regions, there has been only selected improvements in data provision at the sub-national level to facilitate and support decision-making at these different geographies. Then there is an argument that devolution processes evolve in the presence of a devolved data deficit. This point was made in a speech on *‘Devolution and the Northern Powerhouse’* by the then Communities Secretary Greg Clark, where he noted that data devolution was an essential foundation for successful devolution:



*“To make the best investments for local growth... to fully understand the skills and infrastructure requirements of local businesses... to provide public services that respond to local needs... local decision-makers need up-to-date, accurate and meaningful information.....[and] ....in an over-centralised country, information is sucked upwards, away from the frontline, and into separate top-down bureaucracies. The only place where data can join up again is in distant centres of control – if indeed it joins up at all. Furthermore, in such bureaucracies, information is homogenised and aggregated, erasing the fine detail on which the local picture depends.” Clark (2016)*

These types of issues are particularly acute around fiscal decision-making at sub national levels. While fiscal decisions at a UK level benefit from a series of national level macroeconomic models, these same models may be less than useful in informing regional level decisions. In this respect debates around the regional effects of the 2016 Brexit vote recognised that regions, city regions and other areas are asymmetrically affected by various economic ‘shocks’ that may hit the UK economy. Indeed Bristow and Healey (2015) show that the credit crunch of 2007-08 revealed the need to better explain the ‘black box’ which surrounds an understanding of the:

*“Adaptive capacities of regional actors in the face of recessionary crises and how these relate to economic resilience.” (p.241)*

Across the UK then there are issues resulting from further decentralisation, and these data issues will affect the economic intelligence capacity of the respective administrations. This is particularly evident in emerging issues around tax devolution and regional government borrowing. Differential access to data and economic modelling capacity might mean that the capacity and ability of policymakers in the devolved nations to engage with tax devolution problems, debates and practice differs significantly. The next section considers some of these issues in the context of the Welsh economy.

### **Welsh economy: Data, economic modelling and taxes**

Welsh government spending is largely funded by a block grant from the UK Treasury. This has historically been determined by the Barnett formula, which works to adjust the amounts of public spending given to the devolved nations to link with parallel changes in expenditure given to public services in England or Great Britain as appropriate. As a result, outside of Council

Tax, there were few connections between tax revenues raised locally and resources available for the Welsh Government to spend on public services. Then in Wales the devolution of fiscal policy has been limited, as it has across other devolved nations. However, following the *Holtham Commission* (2010) and the *Silk Commission* (2014) reports in Wales and the earlier *Calman Commission* (2009) in Scotland, there has been a greater push for more economic powers. Following the *Scotland Act 2012*, Scotland acquired the ability to raise or lower income tax as well as to vary other taxes, and following the Scottish independence referendum in 2014, the *Smith Commission* (2014) published a further set of recommendations including complete power over income tax rates, VAT raised in Scotland and greater borrowing powers.

Wales has followed a slightly different trajectory. Following the *Wales Act 2014*, the country was to gain control over a number of taxes. From spring 2015 business rates were fully devolved, and 2018 was expected to see the end of centrally set stamp duty land tax and landfill tax which was to be replaced by taxes set in Cardiff. The latter two taxes are expected to raise around £284m (Welsh Tax Revenue Forecast, 2018-19). Perhaps more importantly, due to its scale, is the Welsh Government gaining responsibility for around £2 billion of income tax derived from Wales i.e. over 10 pence of each tax band. Ifan (2016) shows that these changes mean that revenues that amounted to an estimated £4.2 billion in 2014-15 will come under the control of the Welsh Government. These monies will also work to increase the borrowing capacity of the Welsh Government. Welsh Government has gained new revenue borrowing powers (up to £500m) to offset differences between tax forecasts and receipts, and a £500m capital borrowing facility to fund major capital projects. As a reflection of these changes, tax-raising powers are now far more prominent in the manifestos of the main political parties in Wales (Ifan, 2016).

Despite the interest in devolving tax raising powers, there has been little in the way of either an increase in regional economic data availability or economic modelling capacity to support decision makers in implementation or understanding the effects of different tax structures and rates. Indeed, considering the latest tax powers devolved to Wales, there has been little emphasis in the legislation on the capacity for economic intelligence. However, the Commissions that led to these taxes being devolved noted the need for greater provisions. For example, the (second) *Silk Commission* report (2014), Recommendation 11, states that:

*“Both Governments (London and Cardiff) should improve the production of economic data and economic modelling capacity”.*

Since the publication of the Silk Commission report, and the resulting *Wales Act 2014*, some structural and administrative progress has been made with the establishment of a Welsh Treasury function. However, it is difficult to establish the extent to which the Welsh Government are currently undertaking greater economic analysis of the potential implications of fiscal changes, or are working with the ONS to produce more officially sanctioned data. This is particularly problematic given the tight funding context for governments and public agencies such as the ONS. There have been small scale projects (including specific support to develop tax models for Wales) but the true value of economic data is realised when the information can be independently verified and the outputs are disseminated as widely as possible.

General data problems were also noted by Poole et al. (2016) in their development of Government Expenditure and Revenue estimates for Wales in 2016. They also provide evidence of a two-speed approach across the devolved nations of the UK, revealing that in Northern Ireland and Scotland there had been annual fiscal balance reports published and disseminated compared to limited disaggregated public spending, tax and other economic data for to Wales. Poole et al. (2016) make the point that in the Welsh case:

*“Since the establishment of devolution, there has been a glaring absence of official government publications that quantify Welsh public expenditures and revenues in order to provide an estimate of Wales’ overall net fiscal balance. Instead, two government commissions have attempted to meet this need [Holtham Commission and the Silk Commission]... The stark difference between these two fiscal balance estimates means that a more granular multiyear and frequent calculation process is urgently needed. Except for recent experimental HMRC data on tax receipts disaggregated on a four nation basis, there currently exists no annual publication to collate, analyse and disseminate public finance data to enhance public knowledge of Wales’ ongoing fiscal position.” (p.7)*

Data problems are also particularly acute around inter-regional trade and export/import data, and with this type of information important for the construction of more detailed economic accounts and economic models in a small open economy such as Wales. In Wales there are

growing demands to understand industry trading propensities. During much of the 1980s and 1990s Wales maintained a relatively strong performance in attracting inward investment, and with these firms maintaining strong and complex trade linkages with UK and overseas firms (Hill and Munday, 1992). Issues around trade data have become far more acute following the Brexit decision, while this data is also a necessary component of economic models that would provide support for tax-related and other economic policy decisions. There is some information available on Wales' overseas exports through HM Customs and Excise statistics. However there is very little information available on trade between Wales and other parts of the UK. It is therefore more difficult to establish how far Welsh industries are exposed to falling demands from UK-wide companies that might lose European trade (see Welsh Government, 2018). Table 2 summarises the situation in respect of trade data for Wales. The need for high quality trade data is expected to be common across the devolved administrations. Each of the devolved economies are relatively open, and trade is a means through which external shocks are transmitted.

*Tables 2 & 3 about here*

Regional economic data in the form of basic IO tables, and with these the building block for more complex economic models and accompanying analysis, is a useful framework through which to better understand the regional effects of fiscal and government expenditure changes. IO tables are key elements of national accounting frameworks in developed states. They have a wide application in understanding the connections between industries in an economy, and the trade propensities of different industries, and have often been used for economic planning purposes. Critically IO tables are also a foundation for the construction of social accounting matrices (SAMs) which show the flows of all economic transactions occurring within an economy, and more detailed interconnections between households, firms and government. Together IO tables and SAMs provide inputs for more complex economic modelling processes that can be used to understand the effects of fiscal and other changes.

In the Welsh case IO tables were produced at irregular intervals prior to devolution. Nevin et al. (1966) produced the first IO table for Wales for 1960. Ireson and Tomkins (1978) produced IO tables for Wales for 1968. However, developments after this were fairly *ad hoc*. Further IO tables were produced by Cardiff University between 1994 and 1996 (Hill and Roberts, 1996, 2001; Brand et al., 1998).

The construction of these tables benefited from a hybrid approach, with some reliance on assumptions derived from UK IO tables, but with the framework ‘improved’ through incorporation of some industry spending survey data from the local area. These tables were used in various ways to assess the significance of different industrial activities, including analyses of the foreign manufacturing sector, but also the coal, steel, forestry and the higher education sectors. Further Welsh tables were produced for 2000 by Bryan et al. (2003) with support from the Welsh Development Agency. These tables were subsequently updated and improved in 2003 and 2007 (see for examples, Jones et al. 2010).

However, while the historical series of IO tables provided some interesting insights into the changing structure of the Welsh economy, and the changing nature of transactions between sectors, their further development has been compromised by the lack of specific industry survey data, trade data, and lack of information on which to develop social accounting matrices. Perhaps more critically IO tables produced in Wales are not classified as ‘official statistics’ being produced by the higher education sector as opposed to the ONS. Moreover, the IO framework when used for economic modelling is a demand driven framework and therefore supply is assumed to be exogenous (see Miller and Blair, 2009). This makes tax assessment more complex and suggests that the frameworks developed in Wales can only be a starting point for more complex approaches including computable general equilibrium (CGE) models. The latter family of models overcomes some of the limitations of the IO framework in terms of fixed prices and elastic supply. For example in the case of tax, the CGE model allows for an exploration of how variations in the tax might impact upon price levels in the economy. This is not to say that other economic models of the Welsh economy have not been developed. For example, econometric models of Wales have been used to explore the effects of migration on tax yields (see Foreman-Peck and Zhou, 2016). Moreover, national economic consultancies, such as Cambridge Econometrics provide economic models (for example the Local Economy Forecasting Model - LEFM<sup>3</sup>) through which future forecasts of regional output and employment can be developed.

In summary, IO tables for Wales have been developed using very incomplete ‘official’ data, with gaps filled using multiple sources and methods of estimation. In the Welsh case, the

---

<sup>3</sup> Further details of the model are available at <https://www.camecon.com/how/lefm-model/>

demands placed by the devolved administration would seem to create the need for more and better data and more reliable/complex economic models through which to explore the effects of tax changes, and changes in government spending.

Table 3 reveals other identified data gaps, and why there is a policy and intelligence need for them to be filled in Wales. However, this type of data is important for most nations and regions. Having import and export information is a key component of understanding high growth sectors in an economy. To date this information in Wales is concerned primarily with manufacturing. This ignores the increasing and significant value of the services sector, a sector that produces output with a value far exceeding the output of manufacturing across the UK many times over. Details on financial services, for example, would provide valuable insight on potential capital flows thus allowing more targeted country specific growth strategies. Linked to trade is the need for inter-regional data from across the UK. Individual firms across the UK often have multiple sites such that shocks in one part of the country affect other parts. Irrespective of progress or otherwise in the Brexit process, there will still be an increasing need to better understand the implications of sectoral connections across the UK and the EU. Inward investment data is often cited as important, and there exists current data from the Department for International Trade. However, lacking in this information is the precise sector and origin of the investment. Having this detail would provide valuable and important understanding of multinational enterprise decisions at a sectoral level allowing targeted inward investment strategies. Finally, a data problem, not just at a Welsh level, but across the UK are more detailed and regular skill demands assessments, disaggregated by individual labour markets. This type of information would provide useful context for debates around the labour market impacts of Brexit.

Returning to the issue of information to inform fiscal decisions, it is noted that the devolved nations are in slightly different positions in terms of capacity to support fiscal policy. Scotland appears to be the most developed in terms of data and modelling, with work extending back over 40 years, and significant links between government and academia to establish long term collaborations. Scotland has a long history of more detailed economic accounts (IO tables recognised until recently as an ‘Official Statistic’ and produced by a dedicated team in Scottish Government). To this is added more complex models regularly used in Scotland to inform business and government decisions (for example, see Ferguson et al., 2007). Undoubtedly the better quality economic accounts available in Scotland has enabled greater levels of economic

modeling work, and developed macroeconomic models for Scotland have seen numerous uses over the years. In the run up to the 2014 independence referendum the outputs of these economic models informed the respective economic arguments put forward by both sides (Lisenkova and Merette, 2013), and more recently such models have been used to estimate the economic implications of Brexit for Scotland (Figus et al., 2017). However even in the case of Scotland the paucity of some regional economic data has been recognized. Figus et al. (2017) comment that:

*‘The need for greater coverage of Scottish trade should be an urgent priority for both the Scottish and UK Governments’.*

In summary there is a general concern elucidated above that the current UK government’s adoption of the principle of subsidiarity and fiscal powers has not been equally applied in terms of economic intelligence.

#### **Discussion: can the Devolved Data Deficit be overcome?**

While the case discussed above focuses on Wales and with wider discussion considering the devolved nations of the UK, there is an argument that the level and detail of regional economic information and modelling for the UK is less developed than it is for some other developed states. For devolved administrations such as Wales to use new fiscal powers in the most effective way possible, there may need to be a step change in the way in which economic intelligence is collected, published and analysed. While there is a need to be mindful of the costs of data collection for both the state and the businesses surveyed, it is difficult to see how small open economies can be expected to make effective fiscal decisions in the absence of well-developed regional economic models, and underlying detailed economic accounts (i.e. survey based IO tables and social accounting matrices). Particularly of concern in the UK context is a seemingly two speed approach where devolved administrations have similar tax varying and decision-making powers, but with this paper suggesting some uneven access to the decision-making tools. The costs of undertaking more data analysis and modelling are not high when set against the potential benefits of better economic policy.

Before any tax decisions are contemplated by the Welsh Government, a set of economic models, based on reliable and detailed information for Wales should already be in place to allow the civil service as well as academics to provide meaningful evidence for debates on

fiscal decision-making. The expertise from both government as well as universities inside and outside Wales should be pulled together to implement these necessary developments to ensure delivery of the economic intelligence on policy changes.

There are a series of practical considerations that could work to improve the amount of economic data available for Wales, particularly the types of survey data needed in the construction of more fine grained economic accounts and IO tables. First it is clear in Wales that a great deal of economic information is collected from firms, but with a lack of clarity on how this data is effectively integrated. For example, the ONS will survey Welsh businesses, but so also do a host of other organisations. This includes surveys undertaken by higher education institutions, surveys undertaken as part of European Structural Fund evaluations, and survey information collected on business ‘basics’ by organisations such as the Welsh Government and its agencies as a precursor to providing grants and assistance to businesses. Hence business information is collected on multiple occasions by different agencies. This also includes basic information that firms provide as part of reporting to Companies House. While information collected by agencies is expected to be subject to data protection issues, more consideration needs to be given in Wales (and possibly elsewhere) to gaining economies in data collection and sharing. This might also allow more resource to be employed in collecting key data from businesses relating to trading patterns. (Indeed there may be an argument that basic information on purchasing directions and propensities should be provided by firms prior to gaining financial assistance from the state.) In this respect there is some encouragement that organisations such as the ONS are already seeking more efficient methods through which to gain economic information from businesses that does not require detailed surveys.

Notwithstanding the above it is expected that there will continue to be problems in gaining accurate information on business trade patterns within the UK (i.e. patterns of intra-regional trade). Currently research is ongoing that is working to develop methods for estimating regional industry trade propensities and purchasing patterns (Economic Statistics Centre of Excellence, 2018), but this is unlikely to be a substitute for information collected from firms. The system of developing regional information on industry technical coefficients from national UK IO frameworks is simply not fit for purpose under the more devolved political settlement, and these problems will also hinder economic intelligence in city regions. There would seem to be scope for greater collaboration between the devolved nations in developing more detailed regional accounts and IO tables; for example Scotland produces detailed IO tables and the



process of construction of these tables would realise economies of scale if other regions collaborated in the exercise, and shared expertise.

In conclusion, the contention of this paper is that much that needs to be done, such that regional decision-making on fiscal and other issues is informed by appropriate economic intelligence. While this problem has been identified in a series of commissions exploring devolution of economic and tax making powers, there appears to have been limited progress in the Welsh case compared to other devolved administrations. One of the fundamental issues that has been at the heart of devolution in Wales has been the lack of a ‘fair share’ of UK government spending. However, without more sophisticated economic analysis to inform potential resource directions this cannot be fully determined. It also appears from the historical review of economic data that Wales has made inroads into producing regional IO tables, but resource and data issues have prevented their regular maintenance. Paradoxically, the Brexit decision has highlighted the more critical economic intelligence issues for the devolved administrations, particularly around their relative vulnerability to tariff and non-tariff barriers on locally-based firms. The economic shocks that Welsh-based businesses might be subject to following a changed relationship with the European Union have been articulated in recent research, but establishing with more precision the full scale of the transition effects will be difficult in the absence of better quality economic data. Moreover, in the Welsh case, discussion over the desirability or otherwise of local tax making powers has not been coupled with enough discussion over whether the data to make such assessment is available.

## References

- Allsopp C (2004) Review of statistics for economic policymaking. Final report to the Chancellor of the Exchequer, the Governor of the Bank of England and the National Statistician, March.
- Bean C (2016) Independent review of UK economic statistics. March. Available at <https://www.gov.uk/government/publications/independent-review-of-uk-economic-statistics-final-report> [Last accessed 1st January 2018]
- Bernanke B and Boivin V (2003) Monetary policy in a data-rich environment. *Journal of Monetary Economics* 50(3): 525–546.
- Boero R, Edwards B K, and Riviera M K (2018) Regional input-output tables and trade flows: An integrated and interregional non-survey approach. *Regional Studies* 52(2): 225-238.
- Brand S, Hill S, and Roberts A (1998) *Welsh Input-Output Tables of 1995*. Cardiff: University of Wales Press.
- Bristow G and Healey A (2015) Crisis response, choice and resilience: insights from complexity thinking. *Cambridge Journal of Regions, Economy and Society* 8(2): 241–256.
- Bryan J, Munday M, Jones C, Roberts A (2003) *Welsh Input-Output Tables for 2000*. Cardiff: Cardiff University.
- Calman Commission (2009) Serving Scotland better: Scotland and the United Kingdom in the 21st century: Final report. See for summary <http://researchbriefings.files.parliament.uk/documents/SN04744/SN04744.pdf> [Last accessed March 27<sup>th</sup> 2018]
- Cities and Local Government Devolution Act (2016) see [http://www.legislation.gov.uk/ukpga/2016/1/pdfs/ukpga\\_20160001\\_en.pdf](http://www.legislation.gov.uk/ukpga/2016/1/pdfs/ukpga_20160001_en.pdf) [Last accessed 1st January 2018]
- Clark G (2016) Devolution and the Northern Powerhouse. Speech at the ResPublica “Finding True North” conference, Salford, July. See <https://www.gov.uk/government/speeches/devolution-and-the-northern-powerhouse> [Last accessed 27th March 2018]
- Crawley A, Munday M, and Delbridge R (2012) Selling Wales: The role of agencies in attracting inward investment. Report, Cardiff Business School.
- Crawley A and Munday M (2017) Priority sectors in city regions? Some issues from a study of the Cardiff Capital Region. *Local Economy* 32(6): 576-589.
- Dilnot A (2015) Letter and Annex to letter to Andrew Tyrie MP, 17<sup>th</sup> March 2015. See <https://www.statisticsauthority.gov.uk/archive/reports---correspondence/correspondence/letter-from-sir-andrew-dilnot-to-andrew-tyrie-mp-170315.pdf> [Last accessed 27th March 2018]

Economic Statistics Centre of Excellence (2018) Improving the quality of regional economic indicators, Project 3.4. <https://www.escoe.ac.uk/projects/improving-quality-regional-economic-indicators/> [Last accessed 27<sup>th</sup> March 2018].

Fenton, T (2016) Supporting devolution: Developments in regional and local statistics. ONS. <https://www.ons.gov.uk/economy/regionalaccounts/grossdisposablehouseholdincome/articles/supportingdevolutiondevelopmentsinregionalandlocalstatistics/2016-05-25> [Last accessed 27<sup>th</sup> November 2018]

Ferguson L, Learmonth D, McGregor P G, Swales J K and Turner K (2007) The impact of the Barnett formula on the Scottish economy: endogenous population and variable population proportions. *Environment and Planning A* 39(12): 3008-3027.

Figus G, Lisenkova K, McGregor P, Roy G. and Swales K (2017) The long-term economic implications of Brexit for Scotland: an interregional analysis. *Papers in Regional Science*, 97(1): 91-115.

Foreman-Peck J and Zhou P (2016) Migration and tax yields in a devolved economy. Cardiff Business School Working Paper, July. Cardiff: Cardiff Business School. See [http://carbsecon.com/wp/E2016\\_7.pdf](http://carbsecon.com/wp/E2016_7.pdf) [Last accessed 22nd November 2018].

Gelman M, Kariv S, Shapiro M, Silverman D and Tadelis S (2014) Harnessing naturally occurring data to measure the response of spending to income. *Science*, 345(6193): 212-215.

Gray N, Pugalis L, Dickinson D (2018) The Northern Powerhouse Meets the Cities and Local Growth Agenda: Local Economic Policymaking and Agglomeration in Practice. In: Berry C, Giovannini A (eds) *Developing England's North. Building a Sustainable Political Economy*: SPERI Research & Policy. Basingstoke: Palgrave Macmillan.

Harrison J (2012) Life after Regions? The Evolution of City-regionalism in England. *Regional Studies* 46(9):1243-1259.

Hill S, and Munday M (1992) The UK regional distribution of foreign direct investment: analysis and determinants. *Regional Studies* 26(6): 535-544.

Hill S and Roberts A (1996) *Welsh Input-Output Tables for 1994*. Cardiff: University of Wales Press.

Hill S, and Roberts A (2001) *Welsh Input-Output Tables for 1996*. Cardiff: Cardiff Business School.

Holtham Commission (2010). Independent commission on funding & finance for Wales, Final report: Fairness and accountability: a new funding settlement for Wales. See <http://gov.wales/docs/icffw/report/100705fundingsettlementfullen.pdf> [Last accessed 1<sup>st</sup> January 2018].

Hoover, E M, (1975) *An Introduction to Regional Economics*. New York: Knopf.

Ifan G (2016) The taxing problem of Welsh Politics. *The Conversation*, May 6<sup>th</sup>. See <http://theconversation.com/the-taxing-problem-of-welsh-politics-58661> [Last accessed 1st January 2018]

Ireson R and Tomkins C (1978) *Inter-Regional Input-Output Tables for Wales and the Rest of the UK 1968*. London, HMSO.

Jensen R C, Mandeville T D and Karunaratne N D (2017) *Regional Economic Planning: Generation of Regional Input-Output Analysis*. Abingdon: Routledge.

Jones C, Bryan J, Munday M and Roberts A (2010). *The Input-Output Tables for Wales 2007*. Cardiff: Cardiff Business School.

Lee N (2017) Powerhouse of cards? Understanding the 'Northern Powerhouse'. *Regional Studies* 51(3): 257-285.

Lisenkova K and Merette M (2013) Can an Ageing Scotland Afford Independence? NIESR paper available at <https://www.niesr.ac.uk/sites/default/files/publications/Can%20Ageing%20Scotland%20Afford%20Independence.pdf> [Last accessed March 27<sup>th</sup> 2018]

McGregor P and Swales J K (2005) Economics of devolution/ decentralization in the UK: Some questions and answers. *Regional Studies* 39(4): 477-494.

McVittie E P and Swales J K (2007) 'Constrained discretion' in UK monetary and regional policy. *Regional Studies* 41(2): 267-280.

Miller R and Blair P (2009) *Input-Output Analysis: Foundations and Extensions*. Cambridge: Cambridge University Press.

Nevin E, Roe A, and Round J I (1966) *The Structure of the Welsh Economy*. Cardiff: University of Wales Press.

Pike A, Rodríguez-Pose A, Tomaney J, Torrissi G and Tselios V (2010) In search of the 'economic dividend' of devolution: Spatial disparities, spatial economic policy and decentralisation in the UK. *SERC Discussion Paper 62*. <http://eprints.lse.ac.uk/33560/1/sercdp0062.pdf>

Ploszaj A, Celinska-Janowicz D, Rok J and Zawalinska K (2015) Regional input-output studies: A systematic literature review. Paper presented at the 18th *Annual Conference on Global Economic Analysis*, Melbourne: Australia. [http://www.euroreg.uw.edu.pl/dane/web\\_euroreg\\_publications\\_files/6511/7727.pdf](http://www.euroreg.uw.edu.pl/dane/web_euroreg_publications_files/6511/7727.pdf) [Last accessed 22nd November 2018].

Poole E, Ifan G and Wyn Jones R (2016) *Government expenditure and revenue Wales 2016*. Cardiff: Wales Governance Centre. See <http://sites.cardiff.ac.uk/wgc/files/2016/04/Government-Expenditure-and-Revenue-Wales-2016.pdf> [Last accessed last 1<sup>st</sup> January 2018]

Sethi D, Guisinger S E, Phelan S E and Berg D M (2003) Trends in foreign direct investment flows: A theoretical and empirical analysis. *Journal of International Business Studies* 34(4): 315-326.

Silk Commission in Wales (2014) Empowerment and responsibility: Legislative powers to strengthen Wales  
<http://webarchive.nationalarchives.gov.uk/20140605075122/http://commissionondevolutioni.nwales.independent.gov.uk/> [Last accessed 27<sup>th</sup> March 2018].

Smith Commission (2014) Report of the Smith Commission for further devolution of powers to the Scottish Parliament. See  
<http://webarchive.nationalarchives.gov.uk/20151202171017/http://www.smith-commission.scot/> [Last accessed 1<sup>st</sup> January 2018].

Stock J and Watson M (2002). Macroeconomic forecasting using diffusion indexes. *Journal of Business & Economic Statistics* 20: 147–162.

Villaverde J, and Maza A (2015) The determinants of inward foreign direct investment: Evidence from the European regions. *International Business Review*, 24(2): 209-223.

Welsh Government (2018) Trade policy: the issues for Wales. Cardiff: Welsh Government. Available at <https://beta.gov.wales/sites/default/files/2018-01/180202-trade-policy-the-issues-for-wales.PDF> [Last accessed 27<sup>th</sup> March 2018)

<b>Table 1: Availability of Official Regional IO Tables: Selected Large Economies</b>			
<b>Country</b>	<b>Official regional tables</b>	<b>Spatial scale</b>	<b>Produced by Public/private/academia?</b>
USA	Yes	State & county	Public/private/academia
Canada	Yes	Provincial	Public
China	Yes	Provincial	Public
Japan	Yes	Prefectures	Public
Germany	No	N/A	N/A
France	No	N/A	N/A
Italy	No	N/A	N/A
UK	No (only for Scotland)	N/A	N/A
Brazil	Yes	States	Public/academia
India	No	N/A	N/A

\*Official tables are only those released and ratified by a Government or approved statistical agency of the government

<b>Table 2: Regional trade data, selected sources and issues</b>		
<b>Data</b>	<b>Main source and frequency</b>	<b>Issues</b>
Value of exports and imports of goods by country and product.	HM revenue and Customs, quarterly	Only direct exports/imports of goods. Does not account for goods exported/imported via UK companies (indirect exports/imports). Value of exports covered but not regional value-added – which will vary significantly by sector/firm.
Value of service exports from Wales by functional category and selected products.	UK Balance of Payments - The Pink Book; International Trade in Services, ONS. Annual data.	Experimental estimates. Several indicators used to apportion national estimates to regions. Value of exports covered but not value-added – which will vary significantly by sector/firm. Work is ongoing at ONS to develop estimates by country or continent destination.
Number of exporters and importers of goods and/or services (business counts)	Annual Business Survey, ONS. Annual data.	Experimental official statistics. Covers non-financial VAT or PAYE registered businesses. The method involves apportioning out a trade status of an enterprise to its local units based on employment. While labelled as business counts, the counts relate to reporting units.
Counts of exporters and importers of goods.	HM Revenue and Customs quarterly.	Information is available using a whole number method (a business counts as 1 in each region they have employees) and using a proportion method (where each business counts as 1, subdivided across all regions based on the number of employees in each region).

**Table 3: Examples of regional economic information gaps in current climate**

**Information gap**

**Regional imports of services**

To provide a more complete account of export and import activity by sector. Information on the reliance of regional firms on imported services. A key gap in relation to regional economic modelling.

**Inter-regional trade**

To provide a more complete account of export and import activity by sector by providing 'indirect' trade. A key gap relating to regional economic modelling. Will help to more fully assess regional impacts of EU transition via changes in activity in rest of UK firms.

**Inward investment time series data by more detailed sector/origin.**

To provide a better understanding of trends for monitoring purposes. International firm decisions particularly sensitive to uncertainty and access to EU market/tariffs.

**Skills demands/use by nationality and selected sector.**

To provide a better understanding of the potential labour market impacts of EU transition on selected sectors/firms.